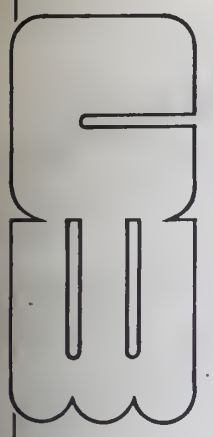

Martin Sees User Ease As Future Key

By Ronald A. Frank
Of the CW Staff

NEW YORK – The key to the future growth of the computer industry lies in providing terminals a large portion of the working force can use. These operators should enjoy using the terminals and be able to get valuable information from them with minimum effort, according to James Martin.

Critical to the improved man/machine dialogue of tomorrow's terminals is the necessity of making the devices sufficiently attractive and easy to use so the operators "get hooked" and want to use the equipment, he said. This aspect can be called the psychology of the man/machine interface, Martin said.

The noted industry author and staff member at the IBM Systems Research Institute made the remarks during an interview describing what he will cover in a seminar called "Design of Teleprocessing Networks and Data Base Systems for the Future."

The seminar is sponsored by the International Systems Corp. of Lancaster (Iscol), a nonprofit arm of the University of Lancaster in England. It will be presented in Washington, D.C. next week.

In designing teleprocessing and data base systems, one of the starting points is the design of the dialogue. And it is only after the user has some idea of the dialogue design that he can begin to think about the response time, traffic volume, file structures and other factors, Martin said.

In working out what the machine says to the man and the man says to the machine, the user may be using software to help him or he may be creating his own dialogue, using Assembler language or Cobol.

After this step, the user is in a better position to start thinking about his teleprocessing design, Martin said. "We have continually got to improve the man/machine interface over the next 10 years," the industry expert said.

In the '60s, teleprocessing systems had constrained dialogues that were very tight in the number of bits produced such as in airline reservation systems. These systems were not really valu-

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NEWSPAPER

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N.H. Court Halts Peddling Of Consumer Credit Files

By Ronald A. Frank
Of the CW Staff

NASHUA, N.H. – A local credit bureau has sent area residents a letter offering "sole possession of your complete credit file before it becomes part of a large computerized data bank."

The letter caused numerous complaints to the Consumer Protection Division of the New Hampshire Attorney General's Office and an investigation has resulted in a court order which is now pending against the Credit Bureau of Nashua, Inc.

"We have filed a petition in Hillsborough County Superior Court and obtained a restraining order against the credit bureau selling any of its files to consumers or transferring any files to a computerized data bank" as suggested in the letter, said Richard V. Wiebusch, assistant attorney general and chief of the Consumer Protection Division.

In its court petition, the Attorney General's Office alleged that the Credit Bureau of Nashua, Inc. and its president, Wesley C. Pike, are threatening to sell the credit files to a consumer reporting agency and this action would be a violation of the New Hampshire Fair Credit Reporting Act. The petition asked that the credit bureau be permanently enjoined from completing such a sale.

It was also alleged that the letter, sent to 60,000 persons, included "several misrepresentations," and the court was asked to order the credit bureau to send out another letter correcting them, Wiebusch said, "before [Pike] resumes selling the files to consumers."

The petition also asked the court to order the credit bureau to refund any money paid by consumers to buy their files between the time the letter was mailed on May 30 and the date of the Attorney General's petition on June 10.

'The Choice Is Yours'

The letter told consumers that "your complete file will be sent to you by first class mail. You will be the sole owner of your file, no copies will be retained. Simply sign below and return this letter to us with $7.50 to cover service and handling fees. It is your privacy, the choice is yours."

The letter said 15 days should be allowed for processing of the file.

One consumer who went to the credit bureau in person after receiving the letter asked to buy his file and take it with him. He was told the file had to be mailed, but he would be allowed to view the contents of the file.

After reviewing the information in the file with a representative of the credit bureau, the consumer paid the $7.50 and was given a receipt marked "for file to be mailed."

"At this point we are satisfied that the Credit Bureau of Nashua has been halted from going forward with the activities that threatened to cause immediate damage. And before [Pike] resumes these activities, we want the court to impose

(Continued on Page 2)

Cobol-DBMS Link Gets Nod

By Don Leavitt
Of the CW Staff

MONROEVILLE, Pa. – Debating whether "the Codasyl specs" for data base management systems (DBMS) should be considered the standard for implementors is now academic. But comments are wanted now more than ever, according to a Codasyl source.

Codasyl's Programming Languages Committee (PLC), which is responsible for continued development of Cobol language specifications, has approved the first specifications for a data base facility in Cobol.

Similar specifications for Fortran can be expected "very soon," according to PLC's chairman, Ron Ham of Digital Equipment Corp.

The original data base management specs were published in 1971 by Codasyl's Data Base Task Group (DBTG) and have been the subject of some controversy, but acceptance has been growing since then. Some observers argued the report merely recapped capabilities of DBMS then in use, rather than suggesting directions in which they should develop.

The DBTG report outlined two aspects of approaching data base use. The data description language (DDL) supports the generation of the data base itself and is generally referred by DBTG to as the "schema." The data manipulation language and "subschema" operations provide the application user interface with the stored data.

DBTG noted data base systems were accessed either by a special language unique to a given DBMS or through linkages to and from the user's "host" language, such as Cobol, Fortran, Assembler or PL/1.

A Data Description Language Committee organized within Codasyl since 1971 formalized its efforts by publishing a "DDL Journal of Development" in June 1973 through the National Bureau of Standards.

(Continued on Page 3)

Army 'Excising' Dissidents' Dossiers

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – The Department of the Army has "initiated steps to excise" intelligence dossiers on American dissidents and antiwar protestors from its files and "store them separately pending further instructions" from the Senate Select Committee on Intelligence, a spokesman for the Defense Department (DOD) told *Computerworld* last week.

The DOD is expected to release further information on the matter shortly but, until cleared through channels, that information will not be available to the press, the spokesman said.

The records are being retained in accordance with a Jan. 28 letter from Sen. Mike Mansfield (D-Mont.) which requested that no information which might be pertinent to the committee's investigation be destroyed, the spokesman said.

The same request was made to the DOD, the Central Intelligence Agency and the Federal Bureau of Investigation, a staff member for the Select Committee said.

The committee is expected to look at some of these files and determine how they should be handled in keeping with the provisions of the Privacy Act of 1974.

Creating Problems

Improperly collected files are creating problems for officials faced with interpreting the Privacy Act, especially in cases where they have been set aside for safekeeping and, in essence, are no longer active files, according to Mary Lawton, deputy assistant attorney general at the Office of Legal Counsel for the Justice Department.

The Privacy Act requires that government agencies publish the existence of all files of personally identifiable information in the *Federal Register*. However, since these files are no longer active, the question of whether they need be reported has been raised.

The Army's Counter-Intelligence Analysis Division files exist in at least two forms – the first is microfilm with a computerized index – and are still in the hands of the Army.

The second form is a computer printout that is in the hands of the Judiciary Committee's Subcommittee on Government Information and Individual Rights.

The printout, used as evidence in the case of U.S. vs. Tatum (a Supreme Court case involving Army surveillance of American citizens abroad), has been classified as "evidence," which would not be required to be reported, Lawton said.

Bella Abzug (D-N.Y.), chairwoman of the House Judiciary Committee's Subcommittee on Government Information and Individual Rights, has suggested the Army files in question be reported in the *Federal Register* so individuals on whom the Army maintained records during the late '60s may obtain copies.

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Please address all correspondence to the appropriate department at 797 Washington Street, Newton, Mass. 02160. Phone: (617) 965-5800. Telex: 92-2529.

OTHER EDITORIAL OFFICES: England: Computerworld, c/o IDC Europa, Ltd., 140-146 Camden Street, London NW1 9PF. Phone: (01) 485-2248/9. W. Germany: Computerworld, c/o Computerwoche GmbH, 8000 Munchen 40, Tristanstrasse 11. Phone: 36-40-36/37. Telex: 5215350. Asia: Computerworld, c/o Dempa/Computerworld Company, Dempa Building, 1-11-15, Higashi Gotanda 1-chome, Shinagawa-ku, Tokyo 141. Phone: (03) 445-6101. Telex: 26792.

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Brings Group to Full Strength

Ford Names Four to Privacy Commission

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – President Ford last week announced his long-awaited appointments to the Privacy Protection Study Commission, created by the Privacy Act of 1974. His announcement brought the commission to seven members, its full authorized strength.

The new members are William O. Bailey of West Hartford, Conn., executive vice-president of Aetna Life and Casualty Co.; David F. Linowes of Scarsdale, N.Y., a certified public accountant and partner in the New York firm of Laventhol, Krekstein, Horwath and Horwath; and Willis H. Ware of Santa Monica, Calif., a member of the Rand Corp.'s Corporate Research Staff.

The will join Rep. Edward I. Koch (D-N.Y.) and Rep. Barry Goldwater Jr. (R-Calif.), cosponsors of several privacy protection bills; Minnesota State Sen. Robert Tennessen, sponsor of that state's privacy law; and William B. Dickenson of Philadelphia, retired chief news executive and managing editor of the *Philadelphia Bulletin.*

Koch and Goldwater were appointed by Speaker of the House of Representatives Carl Albert, and Dickenson and Tennessen were appointed by Vice-President Nelson Rockefeller in his capacity as president of the Senate.

Linowes, a Democrat, has been described as "a businessman active in social issues" and is the author of *The Corporate Conscience* and *Strategies for Survival: Using Business Know-How to Make Our Social System Work.*

Ware served as chairman of the Secretary of Health, Education and Welfare's (HEW) Advisory Committee on Automated Personal Data Systems and helped draft the well-known report to the HEW Secretary on the subject.

Bailey is chairman of Intercontinental Reinsurance Co. Ltd. and a member of the Department of Housing and Urban Development's Flood Insurance Advisory Committee. He is also director of Hartford's St. Francis Hospital and a corporator of the Hartford Hospital.

Koch told *Computerworld* he was pleased the private sector and state governments are represented on the commission.

"I intend, as I hope the other members do, to pursue hearings regarding the impact of privacy legislation with an open mind," he said.

"The legislation which Barry Goldwater Jr. and I have introduced is for the purpose of eliciting comments – it is not set in cement. Undoubtedly there must be additions, deletions and changes.

"That is why the privacy commission came into being – to provide a forum for that testimony," he said.

Private Sector Awareness

A spokesman for Goldwater said the congressman is very happy to see the new appointees bring an awareness of the private sector to the commission.

Goldwater described the three new appointees as people with "established credentials in the subject [of privacy] who will be willing to devote full attention to the commission responsibilities," the aide said.

With only two years to do its work, Goldwater feels the commission is going to have to expend its energies "very economically," deciding early just what it's going to concentrate on.

Goldwater is hopeful the commission will dwell more on problems such as the right of people to have access to their files, and the action necessary "in cases where individuals have suffered harm as a result of information collection practices," the aide said.

Policy issues – such as those concerned with behaviorial uses of personal information, for example, which the HEW Secretary's report ignored completely – should take a back seat, Goldwater said.

Goldwater is also very interested in having the committee take a hard look at state and local government because "they are in direct information sharing with the Federal Government," he said.

Koch and Goldwater are expected to initiate a meeting early in July, the aide said, and the first travel money spent in service on the commission may have to be at the expense of the individual, subject to reimbursement by the government, since inaction on the appointments has been accompanied by inaction on appropriation of funds as well.

N.H. Court Halts Credit File Sales

(Continued from Page 1)

some conditions on him," Wiebusch said.

"Our allegation here is, and it would apply to any credit bureau, that selling your files to another consumer reporting agency without the consent of the consumer who is the subject of the file, or the order of a court, is in violation of the Fair Credit Reporting Act," he said.

The violation would apply to both the New Hampshire and U.S. Fair Credit Reporting Acts, the state official added.

Consumer Consent

"An important distinction to make is that we believe the law requires court approval or consent of the consumer before the files can be transferred either in title or possession. But that doesn't stop a situation where a company might simply rent time where the operator of the computer had no access to the information," Wiebusch said.

The U.S. Fair Credit Reporting Act is administered by the Federal Trade Commission (FTC). When asked whether selling a consumer's credit file constituted a violation of the U.S. act, a staff member of the FTC in Washington said, "Based on my knowledge of the Fair Credit Reporting Act, I can't see where there would be a violation of the act when one credit reporting agency sells its assets [the credit files] to another credit reporting agency.

"I can't see where an individual consumer is hurt in this circumstance," he said. In the majority of instances the individual consumer doesn't even know a credit agency has his file, he added, but if an agency has such a file it is a perfectly legitimate practice.

The next step in the New Hampshire legal proceeding will be a hearing on the Attorney General's petition. Such a hearing will have to be requested by the credit bureau.

"There will be a hearing on the merits of the petition, but the date for it has not yet been set," according to Joseph Kerrigan, attorney for the credit bureau.

The hearing will probably take place in several weeks, and there may also be a preliminary hearing on the temporary order issued by the court, the attorney said.

Pike was not available for comment but, in statements to a local newspaper, he was quoted as saying the original letter might have been worded better.

On the Inside This Week

Martin Sees Key to Future Industry Growth in User Ease

(Continued from Page 1)

able to the majority of people.

But, in this era of distributed intelligence, with microcomputers under the covers of terminals, "the user is in a position to be free of dialogue design and doesn't have to worry too much about the number of bits going out over the communications line," Martin said.

Eventually, distributed data bases will arrive, but, at present, most of the data base systems are really file systems. A true data base system has both logical and physical independence and, in a file system, the user is just collecting data together for one application. "What we have got today is not a distributed data base, but a fragmented file system," he said.

The true data base has "application independence" and the user will be able to put new applications onto it very quickly with a minimum of effort. "What we don't have today is software for building a system with many scattered data bases which can intercommunicate, and this is what people mean by distributed data bases."

That type of software will be very complicated, and it will require that something like today's IBM Information Management System (IMS), with a lot less functions, be put into the nodes of a network.

With today's intelligent terminals, much of the information between man and machine never leaves the remote site. The real reason for accessing the central site by the 1980s will be to get at data, not to get at processing power, Martin said, and through the use of teleprocessing this is already partially true today.

Instead of trying to reduce the cost of his communications, the user should concentrate on decreasing the amount of bits being sent out on the line.

One difficulty with this concept is the very high cost of change for users who already have equipment and networks in place, Martin said. The economics of today's software dictate that machines be built that are compatible with the application code the user has written earlier.

The new terminal systems and teleprocessing networks will have to be structured in such a way that they do not obsolete previously written application programs. At the same time, they will have to be compatible with future systems, Martin said.

Tomorrow's systems will have to have "layers of software" that will be housed in the teleprocessing and data base ends of networks so application code written now "will not be destroyed in three years time when the manufacturer comes out with entirely new equipment."

This physical independence will benefit the user by being less costly, and it will benefit the vendor by "leaving him free to invent new forms of physical storage."

The next five years will be very rich with inventions of new storage techniques, he predicted.

The big danger in communications technology is that there will be "an awful lot of incompatibility, because all sorts of network ideas are emerging," Martin said.

Software provided by the vendor will have to allow the user to change his terminal without rewriting his programs.

"We need to be searching for protocol standards "that will allow users to switch from one type of network to another with a minimum of effort.

He said the Higher-Level Data Link Control (HDLC) effort at a protocol in Europe was certainly a step in the right direction. The definition of HDLC is beginning to firm up now among standards groups, he said.

Much of the software rewriting of application code could be avoided if all terminals would conform to one line control such as Synchronous Data Link Control (SDLC). Incompatible terminals could then be connected together. There would also have to be common teleprocessing software to control the network management function which would allow terminals to be connected to different networks.

And, at the back end, if there were physical data independence, the user would be able to change his physical file organization with minimal effort.

These layers of software are complicated and still quite expensive. Ideally, the software would be common to different vendors, he added.

Information about the Iscol seminar is available from Margot Grant, Shoreham Americana Hotel, Washington, D.C.

Cobol-DBMS Linkage Gets Codasyl OK

(Continued from Page 1)

The other half of the effort has lagged behind until now, Ham admitted, but revisions in PLC's own "Cobol Journal of Development" released in May include new verbs and other facilities to give the application programmer access to a separately defined data base.

PLC's inclusion of data base facilities has no direct impact on the American National Standards Institute (Ansi) 1974 specifications for Cobol, but should lead to the "biggest extension in the next standard," Hamm said.

The "ground rules" under which Ansi operates in defining a Cobol standard do not allow it to consider anything that is not in Codasyl's documentation. Ansi may seek revisions or clarifications, but its "only choice for data base is what we're publishing now," he explained.

It is therefore a de facto standard now and several implementors are working with it, Ham went on. PLC is reasonably satisfied with its work to date but "implementors and users are certainly encouraged to react to the proposal as it stands," the chairman said.

The newly approved data base facility for Cobol is described in the form of page changes to the "Cobol Journal of Development" and can be ordered from the Technical Services Branch, Department of Supply and Services, 88 Metcalfe St., Ottawa, Ont., Canada K1A 0S5.

Orders should specify "Codasyl Cobol JOD Page Changes for May 1975" and should include payment of $7.50 per set (American or Canadian) payable to the Receiver General of Canada.

Comments about the proposed data base facilities should be addressed to Codasyl – officially the Conference on Data Systems Languages – at P.O. Box 124, 928 Garden City Drive, here in Monroeville, 15146.

Government Lawyers Probe Function of IBM's Comstat

By Edith Holmes
Of the CW Staff

NEW YORK – While the lead IBM attorney yawned over a copy of "The New Federal Rules," members of the Department of Justice legal team began to read into the record deposition testimony on the market definition aspects of the government's case against the corporation here last week.

The script called for one member of the Justice team to read the questions put to six IBM executives during the Control Data Corp. and Telex actions against IBM and for another team member seated in the witness box to read the answers.

This the government did for two full days and, in the course of that time, outlined the corporation's system for determining competition in the field – a system called Competitive Statistics (Comstat) – and began to get at what IBM thought its share of the market was, based on that reporting system.

IBM's share of the systems market was roughly 70% as of March 31, 1968 and in the neighborhood of 85% by 1969, according to deposition testimony of J.D. Folger and David Donald Allen, respectively.

Both of these men served in the Commercial Analysis Department (CAD) of the DP Division of IBM – the department responsible for Comstat – during this period in the late '60s.

Comstat, according to the deposition of Frank T. Cary, now chairman of IBM, was one effort made by the corporation to measure the market share of its competitors. A reporting system or procedure originating with IBM's Division of Branch Sales Offices, Comstat was intended to monitor all competitive activity within the territories of those offices.

Information on competitors gathered by the sales force in the field was sent to CAD, where it was shaped into reports for top-level executives, Cary said. Other deposition testimony indicated Comstat became the data base for a variety of reports, including the Quarterly Product Line Assessment (QPLA), on which the government bases much of its case.

The IBM sales force was required to report any information it could concerning communication products, time-sharing systems, software packages, DP education and electronic accounting systems produced by competitors and used in the field. This information was entered into a business register – a kind of order/entry system used by CAD to create its reports, according to the deposition of Folger.

Created in 1969, a Business Trends Analysis (BTA) Department was responsible for generating an "adjusted" Comstat, designed to increase the reliability of the figures obtained.

Together, CAD and BTA were responsible for producing the QPLA reports for group executives within the DP Division.

Informal Meetings

Folger's deposition indicated these meetings were held informally about eight times each year. Talk centered around such terms as net sales revenue increases (gross dollars less cancellations and discontinuances), numeric product unit increases (the unit counterpart to the revenue measure) and net position (the installed machines plus those on order, usually expressed in points or dollars when speaking of a variety of machines or in units if talking about a particular model).

While the meetings were informal and somewhat infrequent, Folger's deposition indicated the categories and codes used by the salespeople to report competitive equipment to the business register were sufficiently developed to constitute an official methodology.

Marketplace Needs

The deposition of Warren C. Hume, now senior vice-president and a member of IBM's Management Committee, said the primary purpose of CAD and Comstat was to communicate to the DP development function the needs of the marketplace – particularly with regard to hardware. He said the product line assessment summaries derived from the QPLAs were especially helpful in this area.

Allen's deposition similarly indicated a chief objective of the QPLA was its use as an input for planning purposes.

While business decisions were based in part on Comstat information, these reports were used particularly to identify those areas that needed marketing attention, those competitive or "doubtful" situations where greater IBM sales expertise and experience seemed necessary, according to the Cary deposition.

IBM Portions

By way of putting the government's designations of portions of these depositions into context, IBM was allowed to make counterdesignations of its own.

Its counsel began by having a portion of the Cary deposition read which stated Comstat information was rarely used by the planning function for the DP Division, that planning must depend on more information than that available through the sales force.

Similarly, IBM attorneys read a statement by John R. Opel, now a senior vice-president on the Management Committee, to the effect that such information served principally as a measure of sales performance and the quality of the IBM product line.

Allen's deposition indicated only regional personnel received Comstat numbers, that Comstat was adjusted because of its inability to measure much more than trends and that more time was spent in evaluation of the technical impact this data would have than in forming overviews of competition in the marketplace.

In those portions of the deposition designated by IBM, Allen said he had seen no DP measurements – whether from IBM, market research firms or surveys by the trade press – in which he had confidence. He said he had a plus or minus 10% confidence level in the Comstat numbers and felt they generally understated the strength of the competition in the field.

360 Called 'Marketing Masterpiece'

NEW YORK – IBM's System 360 line was a "marketing, but not a creative, masterpiece," according to a witness for the government in its antitrust case against the corporation being tried in Federal District Court here.

Dr. A.J. Perlis, professor of computer science at Yale University, described the Eniac, Univac I, IBM 704, Control Data Corp. 6600 and Digital Equipment Corp. PDP-8 as "creative masterpieces in the history of computing."

When asked whether the System 360 could be considered creative, however, he replied that the 360 line of machines had revolutionized the marketing, but not the computing, of the industry.

The 360 line catered to the user's need for a progression of machines with increasing capabilities, he said. For the first time, users could go to larger machines without changing their software.

But, he testified, the 360 machine had a "deleterious effect" on computing because they convinced some manufacturers – notably RCA – to copy the IBM concept, producing devices with slightly better performance at a lower cost.

RCA achieved this goal with its Spectra line of computers, Perlis said, but didn't take into consideration the user's need for extensive support beyond the hardware – a support RCA was ultimately unable to provide, he said.

Misconduct Hearing Rescheduled

NEW YORK – The hearing to be held concerning charges of misconduct of the lawyers on both sides of the U.S. vs. IBM antitrust case [CW, May 21] has been rescheduled from July 8 to October 16.

The attorney representing IBM's legal team, Simon Rifkind, asked Judge David N. Edelstein of the U.S. District Court here to reschedule the hearing because he has been invited to travel to Israel to meet with the prime minister on July 9 and 10.

Willing to Decline

Rifkind, a former federal judge for the District Court of Southern New York, said that if the court was unable or preferred not to reschedule the July 8 meeting, he would decline the invitation to visit Israel.

Wishing to accommodate Rifkind as IBM counsel's choice for representation, Edelstein agreed to a date in October if the parties could decide on a more specific time. Meeting a slight intransigence on the matter, he remarked, "Well, October has 31 days, so see if you can arrive at a date which meets your convenience."

Accordingly, IBM and the government decided on October 16.

The government will be represented by Erwin Goldblum, an attorney with the Department of Justice, Civil Division.

Although Problems Have Occurred

Study Uncovers No Evidence of Vote-Tallying Tampering

By Edith Holmes
Of the CW Staff

WASHINGTON, D.C. – The Office of Federal Elections of the U.S. General Accounting Office (GAO) knows of no deliberate attempts to alter a vote-tallying computer program to change election results, according to a report issued last month.

But, although the majority of computerized elections of the past decade have run smoothly and without intentional fraud, some significant difficulties have occurred as a result of management, human operation and technical failures, the report added.

The result of a year's study of the use of computer technology in vote tallying, the report is based on the work of the National Bureau of Standards' Institute for Computer Service and Technology, under contract with the GAO.

With some 30 states having passed legislation permitting punch-card ballots and about 15% of American voters presently using some form of computer tallied ballot, members of Congress, several election officials and the public had become concerned computerized elections could result in a loss of control by authorities and the increased possibility of voting fraud, the report said.

In studying specific difficulties experienced in vote tallying, the institute found failures of management have been responsible for the majority of the problems.

"Sudden technical failures, not predictable or capable of being considered in advance, have not been a significant factor," the report said.

The study said better management procedures during election preparation would have uncovered most trouble areas, preventing subsequent human operation and technical failures. Management must control and properly utilize technological expertise in implementing and operating a computerized election system, the study noted.

Standards Not Met

Many jurisdictions "do not meet the high standards generally expected of the public election process," the institute discovered. There is inadequate control and handling of ballots and other documents, sloppy processing and reporting of vote information, insufficient operational control of computer programs and equipment, poor design and documentation of computer programs, lack of control of the premises in which vote counting is done and little management of the election preparation process, the report indicated.

The study emphasized the need for maintaining public confidence in the election process – particularly when handled by computer.

Information "should be prepared and disseminated to voters indicating what steps are being taken by election administrators to assure the accuracy and security of the vote-tallying process," the report stated, adding that technical safeguards and management techniques developed for sensitive financial and other recordkeeping purposes can be adopted for vote-counting programs.

The institute also recommended jurisdictions include audit trails and documentation in the design and modification of voting programs, a separation of duties in computer center operations, the use of dedicated computer operation during elections and physical controls over storage media containing sensitive application and support software.

To control ballots and hard-copy records for audit purposes, officials can number ballot stubs, make each ballot's precinct number machine-readable and tightly control and document the use of all I/O devices, the study added.

Finally, to protect vote data during teleprocessing, the institute urged election officials to employ synchronous transmission, the use of checksum polynomials and encryption. It was also noted in the study that a complete consideration of the accuracy and security of a computerized vote-tallying system needs to involve all connecting systems, such as computer-based voter registration systems.

"Extensive and thorough preparation significantly increases the likelihood of a smoothly run election and helps ensure against the loss of public confidence which may occur as a result of administrative difficulties," the report stated.

Now "strikingly lacking in a significant number of state and local jurisdictions," functional and physical specifications, acceptance testing, simulation and checkout of the election system are essential to a smoothly run operation, the report said.

Among the design and documentation requirements that can be imposed on computer programs used for vote tallying "to improve their reliability, intelligibility and capabilities for testing and auditing" are the use of high-level languages, table-driven code, modularity, audit trails, specific provisions for entry and exit of test data, flow charting and comments along the program statements.

Acceptance testing should be separate and distinct from the preelection checkout, in the report's view. Any hardware or software failing to pass an acceptance test should be banned from the election, the institute said.

Perhaps one of any election's most important "subsystems" is that set of operations which transfer the voter's choices to the DP part of vote tallying – the ballot, the vote-encoding equipment, the voter and the sensor of the ballot. "Design specifications and acceptance testing of the ballot, vote-encoding equipment and ballot sensor can be coordinated . . . using a statistical sample of voters to simulate actual voting conditions," the study found.

The institute recommended increased state leadership in the area of computerized elections to alleviate a number of problems. States could help their local jurisdictions put pressure on vendors to provide special designs or meet particular acceptance requirements, for example.

Study of Simulation Model Finds

Oil-Shale Mining Doesn't Have to Hurt Water Resources

By Ann Dooley
Of the CW Staff

LAKEWOOD, Colo. – Oil-shale development can occur without undue harm to the water resources if certain conditions are met, according to the results of a computer model simulation study of the Piceance Creek Basin in northwestern Colorado.

The U.S. Geological Survey (USGS), Department of the Interior, together with the Colorado Department of Natural Resources, prepared the report, which describes the hydrology, or ground water distribution, of the 900-square-mile Piceance Basin.

An IBM 370/155 was used to simulate the effects of mining operations in two tracts leased to oil companies by the Interior Department. These are the first two tracts to be leased for the proposed development of the high-grade oil-shale deposits on federal land in the basin, according to John B. Weeks, USGS hydraulic engineer and senior author of the report.

The effects of large-scale development are simulated through the use of the digital model, he noted. Simulated processing results of the oil-shale indicate the effects it will have on the water resources of the basin and also estimate the availability of water for such development.

"Such an assessment is particularly important because, along with the shale-oil itself, water is one of the most valuable natural resources in the region, not only to any future oil industry, but also to existing ranches and farms in the area and in downstream parts of the Colorado Basin," Weeks said.

As of yet, there has been little response to the study from ranchers and farmers whose livelihood depend on the amount of water available to them, he added.

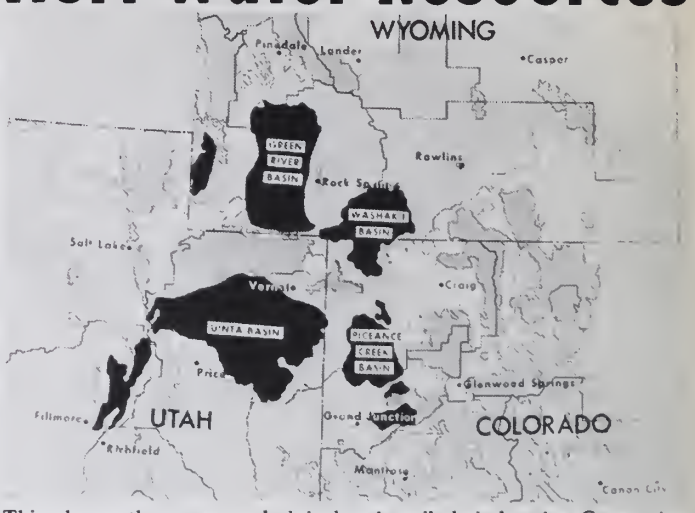
According to the study, irrigation practices are already causing some reduction and deterioration in stream-flow quality, and any major development would also have a certain effect on water resources.

The hydrologic model study will help minimize the environmental impact of any future development of the basin and its huge oil reserves by giving developers a look at the possible consequences of various actions, Weeks commented. Mistakes will be easier to avoid than in the past and regulatory agencies will have information to develop an 'early warning' monitoring system to detect and head off any undesirable changes.

"The model study can also be helpful in determining ways of getting the maximum use out of the available water," Weeks said. By determining that one mine will have more than sufficient water for its use, the excess can be used to offset the deficiency in another mine, he noted.

The data revealed that after 30 years of pumping from the two simulated mines, ground water discharge to Yellow Creek would be only slightly affected, but ground-water inflow along a ten-mile reach of Piceance Creek would cease.

"According to the model, precipitation changes would also have an effect on the basin's water resources," Weeks said, pointing out that, "if atmospheric pollutants from oil-shale development or cloud seeding were to cause a change in precipitation, each 10% change would produce a 40% change in ground-water recharge."



This shows the areas underlain by the oil shale-bearing Green river formation, the largest deposit of oil shale in the U.S.

Professor Asks U.S. Weightlifters To Use System as Well as Barbells

CAMBRIDGE, Mass. – America's Olympic weightlifting team may work out with a computer as well as a barbell if the U.S. Olympic Committee accepts the suggestion of a professor at the Massachusetts Institute of Technology (MIT).

Gary L. Lilien, assistant professor of management science at MIT's Sloan School of Management, said weightlifters can optimize their performance by asking a computer to decide how much weight they should attempt to lift.

"I became quite concerned when I read the U.S. team had done poorly in a competition in Havana," he said. "A number of our lifters 'bombed out.'"

There are two categories in international weightlifting – the "snatch" and the "clean-and-jerk." In the snatch the lifter must take the weight in a single motion from the ground to above his head, arms extended.

In the clean-and-jerk, the lifter first brings the weight up to his chest, then thrusts it above his head.

A lifter's score for each category is the best of three lifts, but once a weight is selected for the first lift, a lifter can't go to a lower weight for a second try.

"A lifter who attempts too little on the first lift may have almost no chance of winning," Lilien said.

Lilien's proposal for optimizing performance requires the lifter to answer three questions: What is the maximum weight he feels certain he can lift? What is the most weight he feels he has the slightest chance of lifting? What weight does he feel he has a 50-50 chance of lifting?

The answers to those questions would be fed into a computer and sifted with past performance records of the lifter and with those of competitors to provide a suggested first lift in each of the two lift categories.

Demonstration Takes Booms Out of Supersonic Flights

CHICAGO – Results of a government-industry simulation study suggest new flight planning techniques can make supersonic flight feasible without sonic boom – those shock waves that crack windows and buildings.

After several months of preparation, United Air Lines recently conducted a computerized demonstration showing jets could fly at slightly above Mach 1 – the speed of sound – without creating sonic boom.

The demonstration included two simulated, simultaneous flights, one east-bound and one west-bound between San Francisco and Dulles International Airport in Washington, D.C., by Air Force FB-111 jets.

The demonstration was given at United Air Lines facilities here for scientists and observers from Kaman Aerospace Corp., prime contractor for the Federal Aviation Administration's Office of Noise Abatement, and the Air Transport Association.

Meticulous Planning

By meticulous flight and route planning, the experiment was able to take advantage of the most favorable meteorological conditions that prevailed. Cruising speeds were as high as Mach 1.34, with simulated altitudes ranging from 29,000 feet to 57,000 feet. The 2,103-mile route was selected so that any shock wave trailing back from the aircraft was reflected below and bent back into the atmosphere.

The computer simulation was conducted in real-time, with observers following the aircraft's performance minute by minute, using a CRT readout.

Boynton Beckwith, United's chief meteorologist, said planning for the flight involved application of weighted values to each geographical area along the selected flight path according to prevailing weather. A safety margin then was added.

With a continuing flow of meteorological data going into the flight planning computer, the plan was updated and modified while the simulated FB-111s were en route. A two-way data link allowed transmission of more current information to a computer in the two aircraft and permitted controllers on the ground to monitor the flights' progress, Beckwith said.

No Boom Reaches Ground

Not once did United's meteorologists' calculations show that a sonic boom reached the ground on the simulated flights, Beckwith stated. In theory, actual jets could do the same thing, Beckwith added.

Dr. Robert C. Bundgaard, chief scientist for Kaman and one of the observers at United's demonstration, said that Kaman at Colorado Springs, Colo., had also successfully simulated 31 coast-to-coast supersonic flights without causing a sonic boom to reach the ground.

This is possible, Beckwith said, by carefully adjusting the aircraft's track, speed and altitude to existing meteorological factors, such as air temperature, atmospheric pressure and winds aloft.

Readily Available

This information is readily available on a nearly current basis from the National Weather Service's network of weather stations throughout the country, Beckwith added.

Beckwith said the typical simulated flight plan developed by United in its studies calls for a cruising level of 57,000 feet at Mach 1.21 (692 knots) for a flight between San Francisco and Washington, D.C. This cuts an hour off the elapsed time for today's actual United flight 130 – a DC-8 operating at 37,000 feet at Mach .80 – between San Francisco and Dulles International Airport.

NC Research Studies Sculptured Surfaces

DE KALB, Ill. – Researchers at Northern Illinois University are seeking to advance current capabilities of numerical control (NC) to cope with sculptured surfaces.

The primary problem is to expand a computer language to indicate complex geometric shapes, the researchers said.

Working under a grant from Computer-Aided Manufacturing-International Corp., John K. Hinds and L.P. Kuan hope to have a system ready for widespread use within the next five to 10 years.

Language System

The researchers are attempting to develop "a sophisticated computer language system that will simplify, or in some cases, eliminate, the many steps in the manufacturing process between the concept and the finished product," such as scale drawings, full-size models and special castings.

By using the sculptured process, a detailed drawing is made and then reference points are plotted to describe the shape of the object.

The researchers use the reference points and a computer to produce instructions to control machines or dies that produce the object.

Fla. On-Line System Tracks Complaints to Convictions

By Nancy French
Of the CW Staff

JACKSONVILLE, Fla. – An on-line law enforcement and criminal justice information system that tracks offenses from complaint to acquittal or imprisonment is helping speed justice to the accused of Duval County.

Built in modules, or subsystems, over a four-year period, the law and justice system shares the county's Burroughs Corp. B6723 dual processor with a myriad of other county departments. It is said to combine the best features of on-line and batch processing, with time-dependent functions performed on-line and less critical jobs run on a batch basis.

Computers At Work In Criminal Justice

Crime – and how to cope with it – is the number one concern of urban Americans today, according to a recent Gallup poll.

In the light of preliminary figures from the Federal Bureau of Investigation's Uniform Crime Report released March 31, Gallup's finding is not surprising. Those figures showed burglary, larceny, theft and motor vehicle theft rose 17% from 1973 to 1974 – the largest increase in 14 years, a bureau spokesman said.

In the same period, serious crimes such as murder, rape, robbery and aggravated assault rose 11%, compared with an increase of 5% the year before.

Citizens are losing confidence in the ability of police to protect them, and many blame the leniency of the courts for allowing the "professional criminal" to evade punishment.

Since passage of the Omnibus Crime Control and Safe Streets Act in 1968, the Law Enforcement Assistance Administration has provided millions of dollars to local, county and state law enforcement agencies to place technology on the side of the police and the courts in an effort to the scales of justice back in favor of society.

Some of these projects have been successful. All have been costly. Several new developments are discussed in this mini report.

Since the system has become fully operational, police response time has been cut from 15 to six minutes. In addition, the county has been able to dispose of 90% of its court cases within 21 days of arrest, according to Frank A. Reneke, DP director and principal developer of the system.

Anyone booked in the county jail is speeded before a judge within 24 hours. Trials in felony cases are now completed within six months and, in misdemeanor cases, within three months, Reneke said.

The system goes into operation when a request for police assistance is received by the Law Enforcement System Street Index Inquiry Subsystem, which dispatches the nearest patrol car to the scene of the incident, Reneke said.

When the sheriff department's Communications Division receives a complaint, a police record specialist inputs the information through a Burroughs B9353 CRT, with display screens formatted for visual request of sequenced information, Reneke said.

Entry of the address of the complainant initiates a search to verify that the address is real. If not, a message is transmitted back to the receiving clerk while the complaint is still on the line.

Once the address is validated, the reporting area, zone and beat number of the police unit in whose area the call occurred are displayed on the CRT screen along with other site information, such as nearest street intersections.

When this data is complete, the clerk transmits the information to the central processor, which selects the appropriate dispatcher, logs the call, selects the nearest available unit and displays the information. The dispatcher then radios instructions to the computer-selected unit.

"The dispatcher's display is constantly being updated so he can see the number of calls in process, the status of each call and which units are available," Reneke explained.

As patrolmen call in dispositions to the dispatcher, he enters the information into the system.

This data is used to print administrative reports, including a daily activity log, incident reports and manpower allocation. It also provides statistics for crime analysis.

Court Management Module

Information concerning each suspect first enters the Court Management Subsystem at the booking stage, Reneke said. An in-house data management subsystem implements the operation of the Court Management Subsystem.

This subsystem consists of six Cobol programs – update/inquiry, report extract, report writer, table load, file create and file backup, which build, maintain and secure the data base.

Input for the data base comes through Burroughs TD 802 intelligent terminals located at the sheriff's office and jail and TC 500s in the state attorney's office and the office of the clerk of the criminal court.

The data includes booking reports, jail transfers, releases from custody, formal charges filed, bonding information, pretrial activities, trial entries posted to the docket and posttrial followups.

At the time of booking, the arresting officers pull all records pertaining to the offender from a microfilm file retrievable by a computerized soundex file. Offenders are identified by a Jacksonville Sheriff's Office jail number as well as a Florida Department of Law Enforcement number, which allows the booking officer to access the FBI's National Crime Information Center and the Florida Crime Information Center for additional data such as stolen property, outstanding warrants, wanted persons, stolen vehicles and criminal histories, Reneke said.

The booking report is entered into the system through a Burroughs TD 802 CRT terminal at the jail. Output from the booking activity produces reports that allow court officials to track the offender through all subsequent phases of the judicial process, according to Bill Calcagni, assistant information systems officer.

The judicial process is also highly automated. Reports concerned with actual court appearances begin with the 24-hour bond hearing recap of offenders booked and retained who must have a hearing within 24 hours of their arrest, Reneke said.

Along with it comes an arraignment recap, a 72-hour review of all offenders booked and scheduled for court appearance.

A daily and weekly calendar of court calls tells the sheriff which prisoners must appear in court with the exact time, date and courtroom, Reneke said.

The state attorney's report is matched by the judge's report, which provides the chief judge as well as all other judges with a biweekly summary of the progress of cases.

As a byproduct of these reports, statistics are collected which can be generated for the FBI's Uniform Crime Report.

A TC 500, located in the office of the clerk of the court, is used to enter and receive information for the index, an on-line name listing of offenders. The index is cross-referenced by case number to offenders' computerized criminal history files, the state attorney's case file and the docket, which reports daily progress for each case active that day.

Charges and dismissals are entered via a TC 500 only in the state attorney's office. To assist him, a list of defendants awaiting trial and those scheduled for a hearing that day along with action taken or scheduled is printed out at his terminal each morning.

The clerk's office updates the criminal history records with dispositions and issues a daily disposition report.

Although the system is shared by the county's other departments, security of the law enforcement portion of the system was approved conditionally in December for interface with the National Crime Information Center (NCIC) and was the first shared system to receive such approval, Calcagni said.

Physical entry to the center is granted via a card-key door system.

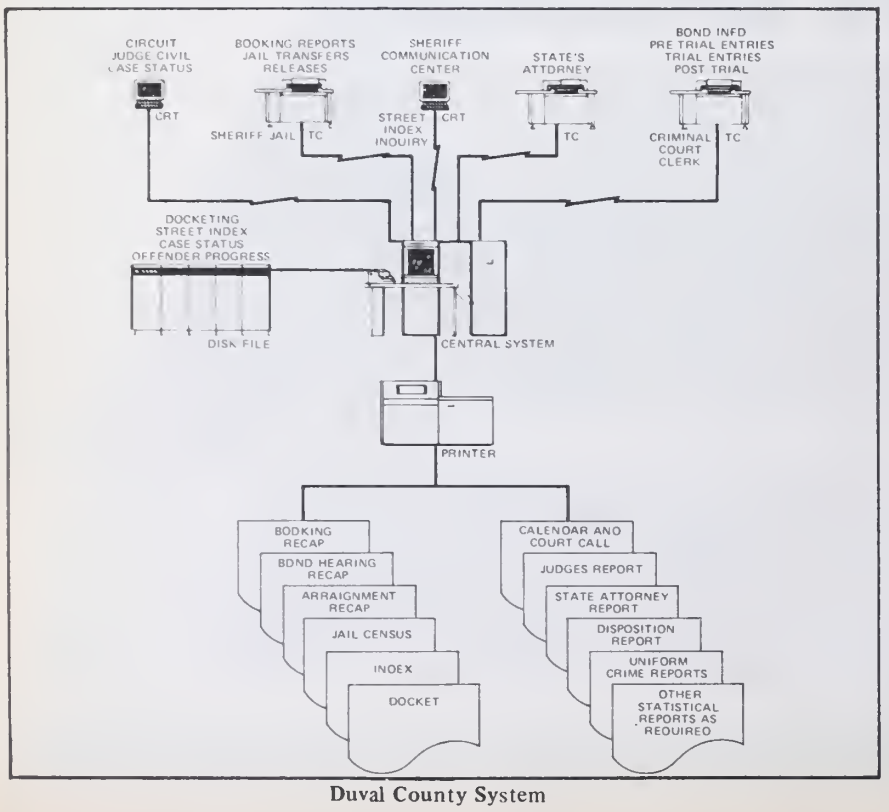
Terminals are located in secure areas with guards on duty 24 hours a day or locked when not in use, and access to the system is protected through a two-level security hierarchy, Calcagni explained.

"Data communications software and applications programs either permit or disallow the terminals to communicate," he said.

"The first hierarchy allows only terminals dedicated to criminal justice agencies to gain access to criminal justice programs," he said. "Then, within that program, only those terminals authorized to access that particular data base can access that data.

"To gain access to the system, a intruder would have to know transaction codes and be able to put in an identifying personnel number, too," he said.

All inquiries to the state or NCIC system "go through our mainframe," he explained, "but NCIC responses come back to us on a dedicated line via a Teletype in the sheriff's office."



Duval County System

Police in 14 Towns Get Help from CIRRS

NEW HAVEN, Conn. – Fourteen Connecticut communities are using a new, on-line Case Incident Regional Reporting System (CIRRS) here to obtain information leading to the arrest of crime suspects, including at least one hit-and-run driver.

Police officers in participating communities file all case incident reports through a terminal at each police headquarters for storage in a centralized data base maintained by the city's IBM 370/135 computer system, Hamden Deputy Chief Don Hasbrook explained.

A minicomputer-based switching system links the towns to the state's criminal record files, outstanding warrants and stolen property and, from there, can switch an inquiry to the National Crime Information Center, Hasbrook said.

Then, participating town police may access these records by:

- Name.
- Address.
- Incident.
- Complaint number.

By keying in the name of a suspect, witness or victim, for example, a detective can bring every incident in which that person has been involved onto the screen.

If the console operator inquires by address, he can retrieve a record of every incident that has occurred at that address, in some cases as long as three or four years ago.

By keying in the incident code such as burglary, for example, the console operator may retrieve a list of every burglary accompanied by complaint number that has occurred within the area within a given time frame.

Finally, by inquiring by specific complaint number, the console operator can bring onto the screen a preformatted individual case report in English text.

Standard procedure for a detective seeking clues to a burglary or assault in his town or city is to feed an inquiry into the terminal in his department based on information he has been able to obtain at the crime scene.

The hit-and-run driver was apprehended through combined use of a telephone hot line and the CIRRS system.

Hasbrook explained, "Cheshire police forwarded the license number over the hot line, indicating the driver was believed to be heading toward Hamden.

"Hamden police input the license number into the system, where it was switched to the state's system, and, within three seconds, we found out his name and where he lived, and the police were waiting for him when he arrived home," he said.

The individual pledged guilty to the hit-and-run charge.

Congress Could Make Automated Records Illegal

States in Bind on Arrest Data Conversion Question

By Nancy French
Of the CW Staff

BOSTON – Legislation now pending in Congress has serious ramifications for states converting rap sheets to get records of their most serious offenders into computerized criminal justice information systems, officials said here. Some even believe systems like this will become illegal when Congress acts.

Computers At Work In Criminal Justice

Rap sheets filed to document arrests rarely note court dispositions, and constitutional rights proponents in Congress believe these incomplete records violate an individual's constitutional rights.

Unfortunately, information from other criminal history documents is "very costly, time-consuming and difficult to assemble," explained Paul Sylvestre, statistician for the Law Enforcement Assistance Administration's (LEAA) Systems Development Division.

"This information must be gathered from state arrest and court files as well as corrections departments to build a complete record for a criminal offender," Sylvestre explained.

The question then becomes: What should the computerized record contain and how much of the taxpayers' money can justifiably be spent on record conversion?

'Not That Much'

LEAA officials believe "not that much" and, since last year, have recommended that states limit the amount of historical conversion that is done.

Under the LEAA formula, each state would establish a computerized name index for every person in the criminal justice system, indicating whether he is in the computerized system or the manual system.

Then, with each new arrest, only that information would be added. This system would force law enforcement and courts officials to work with parallel paper and computerized systems, presumably until offenders in the paper file became too old to be a threat to society.

Most states object to this approach, and instead, "some are building a name file and, after the first rearrest, converting the offender's entire record.

"Right now, LEAA is considering some new recommendations, but what they will be, we just don't know," he added.

About 16 states are presently converting records for computerized criminal history systems, Sylvestre said.

Four Approaches

One of these is Massachusetts, where officials saddled with this state's Criminal History Record Conversion (CHRC) project have learned a lot about the problem through their three-year experience.

According to Steve Long, manager of systems engineering for the state's Committee on Criminal Justice, four different approaches were informally considered:

- Convert no historical data but build the data base with new records as they are received from police and courts.
- Remove elderly and minor offenders from the file and convert all that remain.
- Establish conversion criteria and convert only those records which meet those standards, case by case, until complete records of the most serious offenders are in the data base.
- Convert the entire manual file from A to Z.

"If you're going to have a data base, sooner or later the records have to be put in there, and the implication that somehow the work is going to go away has no validity," explained Chester Stern, vice-president of public systems at Data Architects, the firm selected by Burroughs Corp. to design the software for the state's Criminal Justice Information System.

"The first approach is, therefore, probably the least sensible," Stern said. "If you chose it, you would spend millions on the computer and then have to wait several years before you could actually use it."

All Not Transferred

Converting the entire manual file from A to Z would be unnecessary as well as expensive, Stern pointed out, since a 90-year-old felon poses little threat to society.

Nor are law enforcement officials concerned with people arrested for drunkenness – in many states no longer even considered a crime – nor are they worried

(Continued on Page 10)

What's Pending

WASHINGTON, D.C. – Legislation pending in both the House of Representatives and the Senate set standards for maintaining arrest records without convictions.

Senate Bill S. 1427, drafted by now-retired Sen. Sam Ervin and introduced in the House as H.R. 62, requires that arrest records without dispositions be sealed – or taken off-line – two years after the arrest.

Senate Bill S. 1428, supported by the Justice Department and introduced in the House as H.R. 61, requires each criminal justice agency to adopt procedures reasonably designed to ensure arrest records are followed by a record of disposition within 90 days after the disposition has occurred.

Both bills are in respective committees, and the House Judiciary Committee's Subcommittee on Civil and Constitutional Rights is anticipating hearings on the bills in July.

No action on the measures is scheduled in the Senate.

Conversion Question Puts States in Bind

(Continued from Page 9)

about citizens who have committed moving traffic violations, Stern pointed out.

"Removing the elderly and the minor offenders and converting the rest begins to make a little sense," Long said, "but we didn't want to waste the time and money converting files on offenders who were arrested once in Massachusetts and have since moved to other states.

"The main objective here is getting a record of the serious active offender into the system, and that is what we have tried to do here," he explained.

The Massachusetts conversion procedure was triggered by court appearance slips that flowed into Probation Central to be filed with offenders' dossiers.

Under Massachusetts criteria, a person who had appeared in court for a serious offense and had a previous conviction of any sort became a candidate for conversion.

Each court slip contained the date, offense, name and address of the individual charged, mother's and father's name, complexion, age, date of birth, height, weight and occupation.

A clerk, with court slip and file in hand, fed data into a Digital Equipment Corp. PDP-11 minicomputer via a Hazeltine terminal to initiate a match with files maintained by the Department of Public Safety (police).

When the data was printed out there, a search was made against the Department of Public Safety's soundex file to determine if a file existed on that individual.

If a matching file could be located and identifying information, dates of arrests and court appearances matched and if a fingerprint identifier was available, the information was entered into the data base. Then the clerk at Probation Central added the court data to complete the record.

Records that seemed to match but lacked a fingerprint identifier were also converted but were flagged for future attention.

"We're not sure from the standpoint of recidivism how large the file should be before it's big enough to get good returns," Stern said, but so far 28,000 to 29,000 records have been converted, and the project is slated to continue until November.

At the rate of 130 records per day, officials estimate that nearly 13,000 more records will have been converted by that time.

The conversion rate has speeded up since the records have become considerably shorter and files without fingerprints are being converted without delay.

Photographed at the Sahara Casino, Las Vegas, Nevada.

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Cobb County Holds 'Promis' for Public Prosecutors

By Nancy French
Of the CW Staff

MARIETTA, Ga. – Law enforcement officials and DP practitioners in Cobb County are implementing a computer-based system here to increase court effectiveness by helping the prosecutor evaluate his workload and give priority to the most serious cases.

Computers At Work In Criminal Justice

Developed in the U.S. Attorney's Office in Washington, D.C., the entire Prosecutor's Management Information System (Promis) was a transfer project funded by the Law Enforcement Assistance Administration (LEAA).

Promis was developed to correct problems in the public prosecutor's office that have evolved with the burgeoning crime rate in recent years, according to Bill Hamilton, president of the Institute for Law and Social Research and a member of the system's original design team.

Faced with high-volume workload and inadequate staffing, the prosecutor and his staff have less and less time for case review and preparation. The prosecutor often does not have sufficient staff to assign each case individually and, consequently, cannot hold any one of his assistants responsible for a case from beginning to end, Hamilton explained.

The result: The habitual offender – often referred to as "the professional criminal" – learns he can increase his chances of gaining a series of continuances or postponements by securing the services of a heavily committed defense counsel.

This has proved an effective strategy for exhausting witnesses to the point where they are no longer willing to appear and, all too often, such cases are dismissed "for lack of evidence," an LEAA official explained.

Crime analysis worksheets are completed from police incident reports by paralegal staff members in the prosecutor's office, and this data is fed into the computer.

In Cobb County, the data is captured using Burroughs TC 521 intelligent terminals and batch-fed to the computer center once per day. Files are updated and reports run every night, according to Cobb County's DP manager, Hershell Strickland.

The information includes general facts such as a suspect's name, sex, race, date of birth, address and employment status. In addition, information regarding previous arrests and convictions as well as alcohol or drug abuse is entered.

Also included are data concerning the alleged crime and the defendant's arrest, such as the date, time and place of both the crime and the arrest, the number of persons involved, the graveness of the crime in terms of the amount and degree of personal injury, property damage and intimidation involved.

The computer then rates the crime in terms of the degree of harm done to society rather than in terms of legal nomenclature. A scale developed by criminologists Thorsten Sellin and Marvin E. Wolfgang is used to rate the crime.

The graveness of the criminal history is assessed according to a scale developed by D.M. Gottfredson, in which previous arrests for crimes against persons, such as rapes, homicides, assaults and robberies, receive greater weight. Petty offenses are excluded in the weighting process.

"Built into the software is the ability to switch to disposition data when such data becomes more widely available" to assure protection of the accused's civil rights, Hamilton explained.

Advance List

Promis also produces an advance list of the cases scheduled by the court for each calendar date and ranks the cases according to the priority crime and defendant ratings. As a result, the most experienced attorneys can be assigned to the high-priority cases to assure superior preparation for and prosecution of such cases.

On the other hand, the prosecutor's office may spot cases it will not even take to trial but refer to other departments for attention.

Finally, the system automatically generates subpoenas, or notices for police officers and witnesses before each court date.

Although the system "arrived in pieces" last fall, according to Strickland, the system is nearly implemented with the county corrections unit, the last to be added to the system.

When fully implemented, the system will allow the prosecutor's office, police or corrections unit to track cases via the police department's complaint number, assigned to the criminal incident. This will allow access to the full history of court actions arising from the crime even when many court actions and multiple defendants, trials and dispositions are involved.

The fingerprint-based number assigned by the police department after an arrest also will allow the prosecutor to accumulate criminal history files on offenders and note incidents of recidivism.

Finally, the court docket number of the pending prosecution will enable the prosecutor's office to trace the history of any formal criminal action from arraignment through final disposition and sentencing and to account for the separate fate of each court charge.

To date, Cobb County has spent about $140,000 in LEAA funds for the Promis transfer project and partial upgrade of its hardware. Another $30,000 paid for a systems analyst hired to help identify problems and a consultant to help implement the system. The software and documentation were furnished free of charge.

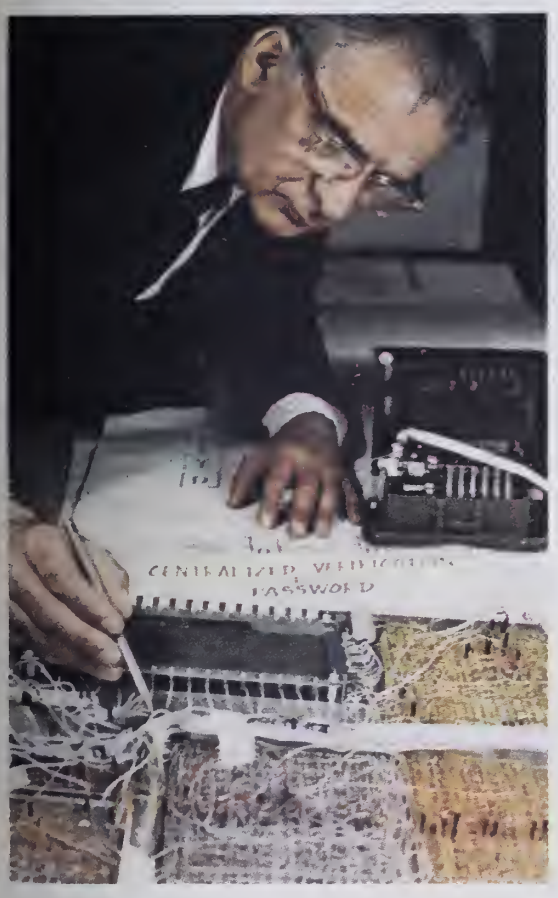
Hardware differences accounted for the least of Cobb County's problems. "Of course we had to make some changes to suit our Burroughs system and we wanted to take advantage of some constructs to save core," Strickland said.

The county's Burroughs B3741 has 150K bytes of core. Three disks are used in daily file updating, Strickland said.

The system, which is completely batch-oriented, has been designed in the cheapest, simplest, most flexible way possible and no program requires more than 100K of memory, according to Alvin Ash, systems specialist in LEAA's Systems Development Division. But Joe LeCroy, project manager, claims to have "gotten the system down to as little as 45K of memory. Written in PL/I, the system took 176K bytes on an IBM 370/158."

DP Dialogue

Notes and observations from IBM which may prove of interest to data processing professionals.



Cryptography and Data Security

The need for data security is possibly as old as human civilization. Hieroglyphics employing cryptography—literally "hidden writing"—were inscribed as far back as the 18th Century B.C. In the India of the 4th Century B.C., ambassadors to foreign courts were explicitly advised to practice "the decipherment of secret writings."

Today cryptography is one of numerous techniques used to insure the security of computer operations. It offers some unique advantages in preserving data integrity and in authenticating the legitimate origin of any command to the computer. This is particularly true where communications lines connecting terminals and computer centers are exposed to alteration of message traffic.

An example of such a situation is in the use of IBM's 3614 Consumer Transaction Facility. This terminal is capable of dispensing cash to authorized customers of a bank at any hour of the day or night. Such a terminal, part of the IBM 3600 Finance Communication System, may be miles away from the bank's central computer. Yet the system is highly secure.

One reason is that the 3600 employs sophisticated electronic techniques to automatically encipher sensitive data, providing protection during transmission over the telephone lines.

Horst Feistel of IBM Research was one of the originators of an IBM electronic enciphering device used for data security. He is shown at IBM's Thomas J. Watson Research Laboratory at Yorktown Heights, N.Y.

How does computer cryptography work? Most ciphers assign substitute characters for alphabetic letters and numerals in the "clear text." Any simple one-for-one alphabetic substitution, however, can easily be broken by frequency analysis. If the letter Q occurs more frequently than any other in a fairly long cipher text, it's highly likely that the cipher Q stands for E, the most frequently-occurring letter in English—and so on. Obviously, simple ciphers won't do for computer use.

What does do the job is an IBM enciphering device which works with the 3614 and uses the computer as its decoding counterpart. Basic to its operation is its use of binary digits—the 0's and 1's of computer language—into which all English characters are converted for computer use.

The device then puts the binary digits of a message through a remarkable series of alterations and substitutions. The effect is to eradicate any telltale combination of digits which, repeated even once in a cipher, might betray a word pattern to a keen-eyed analyst.

Will cryptography find other and wider computer applications? It's quite likely, considering the advanced state of the art. As the need for data security grows, cryptography may find increasingly widespread use. **IBM**

Solving Musical Mysteries by Computer

Plagiarism didn't concern sixteenth-century Italian song writers. They didn't think twice about borrowing each other's best tunes. And nobody minded.

That's the way it was back then. But today, musicologists want to trace precisely who borrowed what from whom. And the computer is helping them do this, just as it is helping them in many other kinds of musical research.

The two scores below show how an obscure musician, Nicola Broca, borrowed a melody from a better-known composer, Josquin des Prés. Nicola even went so far as to twist Josquin's words, and turn a sacred song into a ditty of disappointed love. Out of some 40,000 different tunes, the IBM System/370 Model 158 at the State University of New York in Binghamton selected these two, because they had such similar melodic form. Dr. Harry Lincoln, Chairman of the Department of Music, was then able to compare the printouts of the opening themes, scrutinize publication dates and trace the borrowing.

Musicologists like Dr. Lincoln have to cope with such a vast repertory they just couldn't tackle much research of this kind without computer help. Of course, they must have a way to put a musical score into computer-readable form. And that's why so many musicologists todays are using a coding system called DARMS.

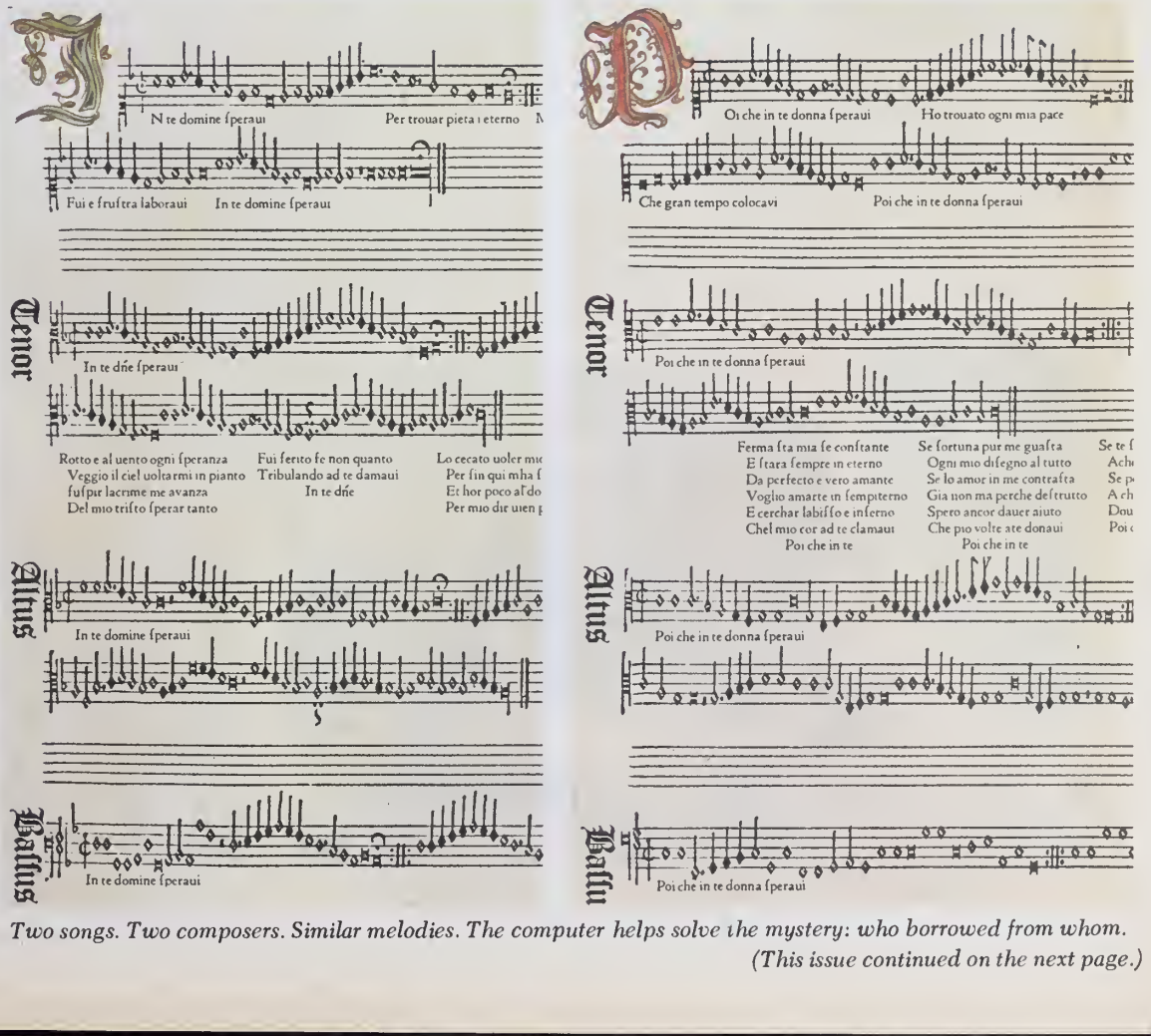
DARMS, Digital Alternate Representation of Musical Scores, was developed by Stefan Bauer-Mengelberg, a visiting professor at Binghamton who is also a staff member of the IBM Systems Research Institute. He says, "Now a musicologist can take any piece of music in standard notation and transcribe it into a code for entry into a computer."

Since musicologists have a way to tell the computer precisely what a composer has scored, they can now process a formidable volume of data. In fact, in many universities today music departments are among the biggest computer users.

With DARMS as their tool, musicologists can develop programs to analyze a composer's use of harmony, rhythm and counterpoint. With this knowledge they can develop a theory about his style, and study how it evolved. They can even attempt to determine when Bach, for example, composed a particular work.

"Once you know enough about composers' stylistic techniques," says Bauer-Mengelberg, "much music that was once dubbed 'anonymous,' or was wrongly attributed, can be ascribed to the right composer. This is especially important in early music, where title pages from folios are often lost."

Looking to the future, Bauer-Mengelberg speaks of how the computer could be used to print musical scores: "Now that a way has been found to make music machine-readable, we hope the day is not far off when we will be able to use the computer in the preparation of master plates for music printing." **IBM**



Two songs. Two composers. Similar melodies. The computer helps solve the mystery: who borrowed from whom.

(This issue continued on the next page.)

Advertisement

From Space Shuttles to Microelectronics

Determining the best re-entry path for a 200,000 pound vehicle approaching earth at more than 12,000 miles per hour . . . Modifying the layout of a tiny microelectronic device to allow for changes in logic capability.

Those are a sample of the kinds of design challenges encountered by engineers at various divisions of Rockwell International Corporation.

To help solve their design questions, engineers at Rockwell are using an online computer capability called the Time Sharing Option. With TSO, many engineers can use terminals located in their own divisions and communicate directly with Rockwell's four IBM System/370 Model 168 computers in Downey, California. An engineer can receive a response to his inquiry within a few seconds, almost as if the computer were dedicated totally to him.

At the Microelectronic Device Division, Bob Larsen (right) and Gerry Lozano verify a set of color masks which represent photoplates used to manufacture microelectronic devices.

Simulating Flight Conditions

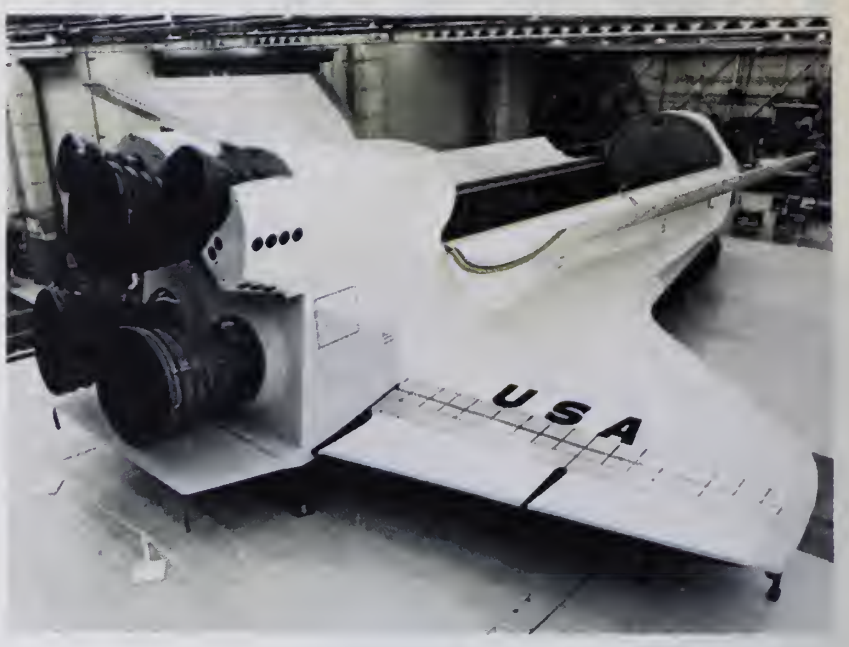
"Interactive computing under TSO has significantly reduced the time needed to develop and debug many of the computer programs needed to simulate the U.S. Space Shuttle's in-flight conditions," says Dr. Joseph F. Gloudeman, director of Management Systems Engineering and Computing Services for the company's Space Division.

"We have also been able to take better advantage of the Continuous System Modeling Program (CSMP), which allows us to simulate a wide range of flight characteristics," adds Ray Brown, manager of engineering applications. "It has proved to be an extremely valuable tool.

"For example, CSMP helps us determine the best angle for the Shuttle's re-entry. That calculation involves a wide variety of data such as the heat caused by atmospheric drag, orbital velocity, and aerodynamic characteristics," explains Brown. "An engineer sitting at a terminal can change any one of these variables and determine almost immediately the impact of the change on vehicle performance."

Completed designs are stored online in a different data base organized under the Information Management System (IMS). Other vital information, such as material and parts in inventory, production in progress and costs, is also stored online.

IMS, TSO and CSMP are all IBM program offerings.



A full scale model of the Space Shuttle orbiter, measuring 122 feet end to end, developed by Rockwell International in Downey, California. Computer simulations played a major role in the Shuttle's design.

"If we have to modify a design for a part which happens to be in production, we can go to a terminal, locate the part by typing in its identification number, and integrate the new specifications immediately," explains Al Barnett, manager of systems development.

Designing Microelectronics

At the Microelectronic Device Division, Bob Larsen, manager of computer-aided design, tells a similar story: "Rockwell programs, written in Assembly and PL/1 languages and developed under TSO, simulate device logic, perform circuit analysis, evaluate nodal speed-noise problems, and even produce our preliminary design layouts.

"Interactive computing keeps our engineers completely involved in the design process, allows them to correct errors on the spot, and evaluate more design alternatives in greater detail."

IBM

STAIRS Steps Up Information Retrieval

Thousands of academic and trade journals are published in the life sciences each year. Hundreds of thousands of papers are presented by scientists and doctors at symposia all over the world. Given that volume of new information, locating facts to solve a specific problem in biology could be a staggering task. Manual library searches would take weeks.

A non-profit organization in Philadelphia known as BioScience Information Service of Biological Abstracts (BIOSIS) has been able to simplify the search task with the help of an IBM computer. Founded in 1926, BIOSIS is now one of the largest abstracting and indexing services for the biological and bio-medical sciences in the world.

Its major product, *Biological Abstracts*, is a semi-monthly publication which summarizes research studies originally printed in over 8,000 primary journals. Subscribers include university and institutional libraries, industrial clients and research centers in over 120 countries.

To answer specific questions posed by research scientists, BIOSIS offers a customized computer search of its data base. All information for the current year is entered into an IBM System/370 Model 145 running under OS/VS1 with CICS. Using an IBM Program Product called STAIRS/VS (Storage and Information Retrieval System), one of BIOSIS's nine information specialists can formulate a simple retrieval within minutes.

A Typical Search

To conduct a typical search—such as the effects of thermal pollution on micro-organisms—the information specialist first selects one of six simple commands built into STAIRS. By typing in the command along with words representing the original question into an IBM 3270 terminal, the specialist will be able to see immediately if his strategy has resulted in a bibliography of relevant items.

If the strategist feels the first retrieval effort is too general, he may refine the strategy to yield more specific references. One example would be to ask for the phrase "thermal pollution" in contrast to the words "thermal" and "pollution."

Other commands enable inquiries to be "ranked" so that cited documents will be listed in order of relevance, "selected" on the basis of certain quantifiable relationships (greater than, less than, equal to) or "saved"—in which both the strategy sequence and descriptive words are stored for future retrievals.

Once the specialist completes the strategy for the current year, it can be used for past years as well. The result of this search is a bibliography of references printed by the computer for use by the client.

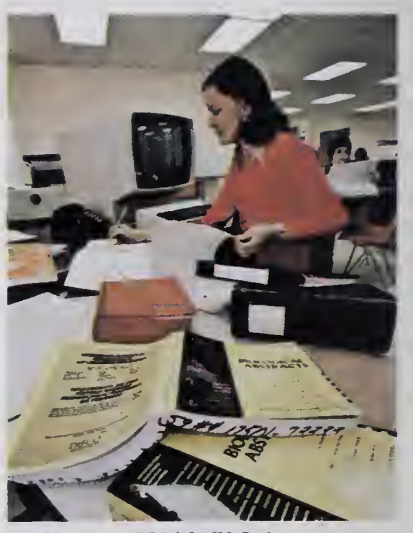
Information Specialist Kay Durkin and H. Edward Kennedy, Acting Executive Director of BIOSIS, discuss terminology to be used for an on line search strategy using STAIRS.

Instant Strategies

"STAIRS has given us the ability to formulate search strategies instantly," says Kay Durkin, Planning Officer in information retrieval. "It helps us to use an open-ended vocabulary so that we don't have to check long lists of established key words. As a result, we can determine the parameters of our searches much more precisely."

"We can teach our staff the rudiments of STAIRS in a few hours," adds Data Processing Manager John Thomas. "It is an extremely well-written, general-purpose program, adaptable to any organization which needs to retrieve information quickly."

Dr. H. Edward Kennedy, acting director of BIOSIS, comments on future trends in information processing: "We feel that many printed publications will someday be replaced by new forms of technology like microfiche and magnetic tape. Some libraries have already started to automate, and services like ours will become increasingly dependent on computer-based retrieval systems."



Using an IBM 3270 Information Display System, Kay Durkin formulates a STAIRS search strategy.

DP Dialogue appears regularly in these pages. As its name suggests, we hope DP Dialogue will be a two-way medium for DP professionals. We'd like to hear from you. Just write: Editor, DP Dialogue, IBM Data Processing Division, White Plains, N.Y. 10604.

75-3

IBM®
Data Processing Division

LEAA Experiment Attacking Transferability Problem

By Nancy French
Of the CW Staff

CHICAGO – Although more than $247 million in federal grants has been awarded to local law enforcement agencies for systems design and software in the past five years, most agencies still are faced with "reinventing the wheel" each time a new system is considered because poor documentation makes it impossible to transfer much more than the conceptual design of systems already funded.

Computers At Work In Criminal Justice

The Law Enforcement Assistance Administration's (LEAA) Region 5, headquartered here, has launched an experimental program to help find out how software should be conceived, written and documented so more of it might be transferred to other jurisdictions.

Hundreds of thousands of dollars could be saved on almost every project if the right approach could be discovered, according to Frank Sass, regional systems specialist.

Under Sass' direction, six test sites have been selected. Each was awarded $200,000 from regional discretionary funds, which, in comparison with most projects, is considered a pittance.

Four-Phase Program

Each test site is the process of undertaking a four-phase program:

- Phase 1 – Determining the agency's information requirements.
- Phase 2 – Locating an appropriate donor site and determining how much would be transferable.
- Phase 3 – Implementing the transferred system.
- Phase 4 – Documenting the transfer.

Each of the six test sites was given the same deadline so programs could be monitored and results published as an aid to future funding projects, Sass said.

Lake County, Ill., was selected as the recipient for a multijurisdictional court system, with special emphasis on booking systems.

The Municipal Court serving Marion County and Indianapolis, Ind., was selected as the transfer site for an integrated court management system with special interest in computerized scheduling.

The Minneapolis, Minn. police department was selected as a transfer site for a computer-aided police dispatching system.

Toledo, Ohio, was selected to receive a comprehensive criminal justice system involving police, courts and corrections.

The Wisconsin Department of Corrections was selected as the recipient for a corrections system, and Michigan's Department of Corrections was selected as a second transfer site for a corrections system.

Overall supervision was placed in the hands of Public Systems, Inc. and Computer Sciences Corp.

"The two corrections systems dropped out right away," Sass explained, for unrelated reasons.

Randall Murphy in Lake County, Ill, said officials have not yet decided whether to transfer the system in Santa Clara County, Calif., or the one in Pinellas County, Fla.

"It has been an excellent learning experience for trying to identify some standards for approaching the problem of adding new applications to a site," he said.

"One of the things we found was you need to carefully review donor sites' hardware, software and statutory responsibilities so you can determine just how similar they are to you. It's much more than thinking about Cobol to Cobol," he said.

Marion County, Ind., project leader Jim Rebo said, "We have decided to leave our home-grown Transmission and Retrieval of Automated Court Information System (TRAC) intact and add reporting module designs from Santa Clara's Court system as enhancements."

Toledo's Regional Criminal Justice System has successfully transferred about 95% of the State of Ohio's system for warrants and wanted persons, according to Clyde Givens, project manager.

"We had to make some modifications such as eliminating duplicate names, adding local computer control numbers and some other subtle changes to account for the different needs of a state and regional system," he explained. However, the project was simplified, by the similarity between the transfer and donor sites.

The Clear system, developed by the Cincinnati and Hamilton County Computer Center is quite different from their own, he said, so "what we've decided to do is take the elements from the system and adopt their codes and then design a data base suitable to the Univac 1100.

The concept of programming will come from the leads system, he said, "and even this much will save us about 30% to 40% in the second half of the system," Givens estimated.

Four Transferability Levels

Andrews O. Atkinson, superintendent of the Regional Computer Center in Cincinnati and Hamilton County, who is presently directing a project to design and implement computer application modules for state and local government management information systems, has identified four levels of transferability for the project sponsored by the Government Management Information Sciences Users Group (GMIS):

- Concept design. This phase is 20% of the total project development cost and is the most commonly transferred aspect of a new system, Atkinson explained.
- Systems design. This Atkinson described as the "logic portion of a system." If this part can be transferred, 50% of the cost of a new system can be saved, he said.
- Programming. Actually writing machine logic, program code and data base management systems makes up another 30% of the project. It is here that the possibility of transfer becomes less likely, Atkinson explained.
- Technology transfer. This involves "how much design went into the system to enhance its transferability," he explained.

In most systems today, the maximum amount of transfer that could be expected is 60%, according to Atkinson, but that could reduce the cost of a $100,000 project to $40,000, he explained.

Editorial

At a Crossroads

The battle between AT&T and the specialized carriers to attract the data communications user will come to a crucial crossroads in the next six months.

Now that Bell has dropped the other shoe and proposed the second step of the two-tier Dataphone Digital Service (DDS) pricing, the Federal Communications Commission (FCC) will have to make some decisions. [See related story on page 21 and in CW, June 11.]

The commission will have to decide whether DDS really is an innovative new technology designed specifically to provide data users with a high reliability transmission medium or whether it is simply an overbuild of existing microwave equipment marketed to appeal to data users.

If the FCC finds DDS is a new technology and the rates now in effect in five initial cities are cost justified, users will probably get a bargain since the specialized carriers will be forced to look elsewhere for customers.

Such an FCC decision would presumably allow DDS to be priced permanently at rates that are about 50% of existing so-called private line charges.

But if the commission finds DDS is a marketing gimmick and the initial AT&T five-city rates are too low, the data user will pay about the same for DDS he now pays for private line facilities from both AT&T and the specialized carriers. This would make the data communications arena remain competitive for a while longer. The users will have to pay the higher charges and there will be a measure of competition that will serve everyone – except the user's pocketbook.

And the stability would probably be short-lived until AT&T or another carrier came up with a package specifically designed for the data user. Perhaps it would be a packet-switched service.

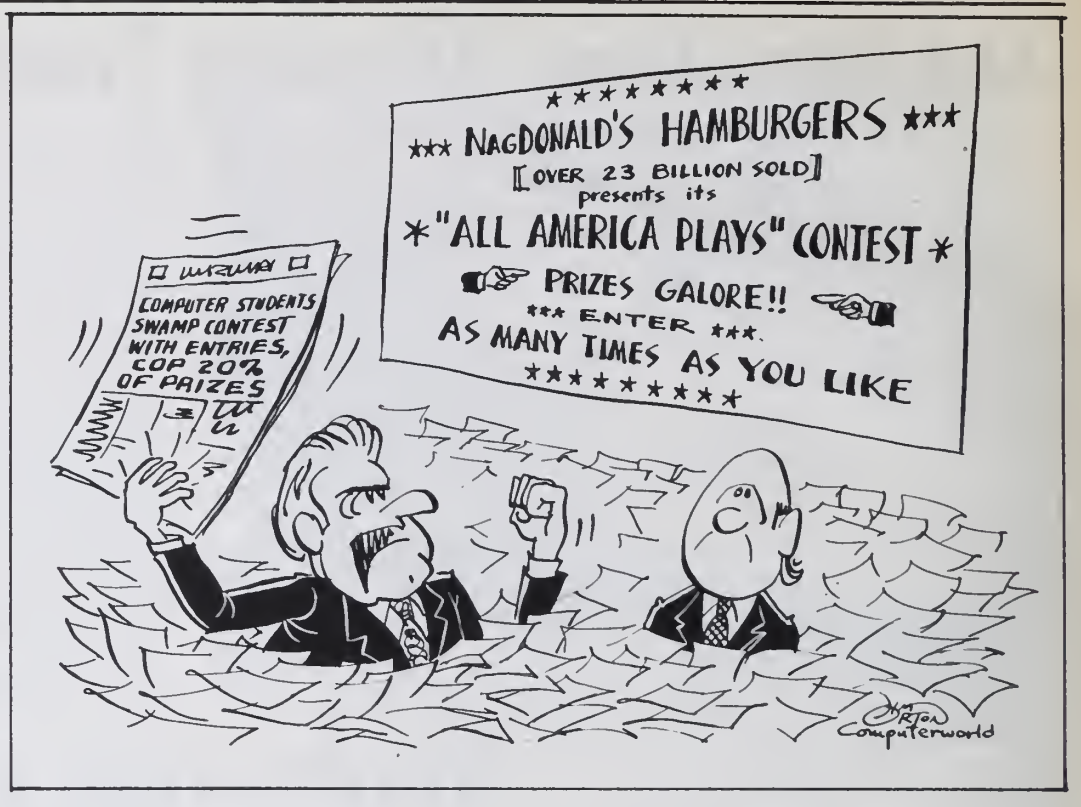
The commission has set a deadline of December 15 by which the complicated DDS proceeding will end and a decision is to be made.

For users, neither alternative is ideal. If the lower rates are judged fair, the specialized carriers will be hard pressed to offer comparably priced data services. Some may go under. And with the competition eliminated, Bell will embark on a steadily increasing schedule of rates, which the user will have to pay. There will be no competition to keep the pressure on Bell.

On the other hand, if the higher rates go into effect, there will be a choice of carriers, but the technology and cost benefits of DDS may never become available to the user (if the benefits are real).

Normally, the user would be urged to take part in the FCC proceeding and make his views known. In this case, it is not clear where the users' interests lie.

Maybe the data user should boycott DDS no matter what it costs and wait for packet switching or satellites or some other technology that will really look out for his interests, without being mired in regulatory pricing schemes.



'. . . And Since It Was Your Idea, YOU'RE Going to Get a Break Today . . .'

Letters to the Editor

McDonald's Should Retaliate In an Equally Creative Vein

In the article, "Technology, McDonald's Collide as Students Best Burger Bonanza" [CW, June 4], *Computerworld* should have pointed out that the complaint regarding the alleged "use of equipment at a state or federally funded school" is invalid.

Caltech is a private school, not a state school. Any federal funds are specific research grants or operating funds for the Jet Propulsion Lab.

Any thinking person would realize the administration of Caltech had no prior knowledge of the plan. They should take no position, as this was not an official school activity.

This incident illustrates part of a continuing dialogue on apathy creatively articulated in Caltech students' extracurricular activities, such as:

- Ripping off an Air Force jet that was under 24-hour-a-day guard (1953).
- Switching University of Washington's card section at the Rose Bowl so it read "Caltech" (1959).
- Pointing out potential security problems with magnetic striped credit cards (1972).
- Constructive critiquing of the engineering of pay telephones, through development of the "infinite dime," the unique deployment of magnetic tape recorders and the "flip across penny."

We should applaud this harmless, creative prank. If McDonald's were genuinely upset, they should have retaliated in an equally creative vein.

For example: McDonald's has an obligation to pay off "innumerable" $5 gift certificates. All private schools urgently need money – Caltech included.

Caltech has a dietician on a tight budget, who would do anything to save a few bucks. Page House has to eat lunch and dinner every day.

Arrange with the dietician to deliver McDonald's cheapest burger to Page House for two meals a day until the obligation is paid.

Robert J. Deffeyes
President
The Cobaloy Co.
Arlington, Texas

Grosch Statement Pure 'Hogwash'

I guess I must be one of Herb Grosch's " . . . mercenaries who are making it possible for manufacturers like Burroughs to seal off their bit-manipulating power from the users and make higher level languages compulsory," [CW, May 7] because I assert his statement is purest Hogwash.

Contrariwise, Mr. Gray Hat, all of Burrough's primary programming languages explicitly provide bit-manipulating capabilities for use when it is wanted, without inflicting the jelly-fish inanity of Assembler-level coding on the entire effort:

- B3500 Cobol – "Enter Symbolic" provides direct access to the entire instruction set of the machine.
- B6700 Cobol – "Move" Options 3 & 4 (Burroughs extensions to Cobol-68) permit bit-level addressing.
- B6700 Algol – "partial-word field designation" provides bit addressability.
- B6700 Fortran – The CONCAT built-in function provides bit addressability.

In sum, Grosch seems to be suffering from a severe case of "nostalgie de la boue" (look that up in your Webster's Collegiate), which is blinding him to the concept of "useful-level" languages – transparent when necessary, supportive when useful.

Robert Higgins

West Chester, Pa.

Good Programming Effective

The arrival of new programming tools may have clouded our viewpoints in judging the quality of our work.

Structure, clarity and maintainability are all properties to be desired in the end product, but must be viewed in relationship to the total job specifications, including any constraints on budget and time.

Some of your recent letters on the subject of programming philosophy have even gone so far as to suggest the programmer make "each program a masterpiece of elegant simplicity." We should judge the performance of the total programming task and not just the final listing of the code.

With this perspective, I offer a modified programming objective: The objective of programming is to produce effective code of good integrity within budgeted time and cost constraints.

The word effective was chosen to suggest that job specifications be met, but not necessarily exceeded. Effective does not even mean that efficient code resulted, but only that enough programming energy was applied in the right places to get the job done on time.

Likewise, running efficiency on the intended computer is compromised. Webster describes integrity as meaning complete or whole, and that ought also to be a property of a program, keeping in mind again the need for balance. Good programming design looks beyond just fair quality but stops economically short of the masterpiece category, but is certainly good enough to serve it's customer for its intended life.

We programmers should dutifully enlighten our customers, but leave them the option of buying only as much of our services as they think they need.

J.M. Cauley

Pittsburgh, Pa.

(Other letters and commentary on Page 18.)

Faster Than a Speeding Cork

This is a story about the DCA, the erstwhile Digital, now Drunken, Computer Association. Many moons ago, in 1952 in fact, the computer hotshots of the Los Angeles area got tired of going East, to IBM Endicott and IBM Poughkeepsie and the Association for Computing Machinery (ACM) and Eastern Joint meetings in the urban slums like Philadelphia. Some of them like Jack Strong didn't own overcoats, and some like Cecil Hastings didn't own neckties (the lack went over poorly in Endicott). So they started their own local group, the DCA. They had technical papers, but lots of social action as well.

In 1954, the East moved in. The Western Section of the ACM held an inaugural meeting at the Rem Rand building on Wilshire Boulevard. I know: I was shipped in from Ohio at GE expense to be the speaker, mostly because as an old friend and drinking buddy of the Card Programmed Calculator Angelinos, and an inveterate western function attendee, I was an effective Judas Goat!

From that time on, it was all downhill technically for the mostly nonacademic DCA crowd. But the feeling of friendship and the chance for good raunchy gossip prevailed; annual get-togethers continued; booze more or less replaced bits; and slides of old-timers in their cups replaced slides of flowcharts.

Every year I go if I possibly can. In 1974 my plane was diverted to San Diego by L.A. fog, and I arrived three hours late, to be greeted by spectacular kisses and a shower of corks. This year the party was held right after the end of the ACM council session on NCC Friday: May 23. And I was only *one* hour late.

One feature of the banquet room was a group of blowups of photos taken the year before by Paul Armer. In one, my happy face was almost completely obscured by a cascade of silky blond hair draped over it by the, ah, welcoming committeewoman. The blowups were part of a caption contest, with bottles of sherry for prizes.

Another surprise, and a very happy one, was the reappearance of Nan Glennan, heroine of many a tech session and cocktail hour back in the '50s. Most of us hadn't seen her in a dozen years. Another, not so happy, was the threat by the motel management to call the cops and have us all thrust out onto the parking lot if we didn't stop yelling and throwing the traditional corks. We cooled it a little, but they wouldn't reopen the bar after the dinner! So we trooped downstairs and paid higher prices where the band was playing.

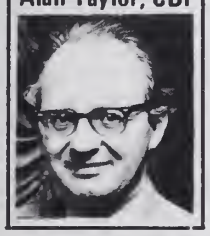
As always, it was a fond brawl. Lots of bigshots, past and current, seeing good friends, Frank Wagner's head, photographically grafted onto the famous *Playgirl* centerfold nude. Gossip about people and jobs and IBM and about old times. Long may DCA wave!

Herb Grosch

Responsibility of Designers

Checks Help Stop Errors Occurring in DP Hot Spots

The Taylor Report
By
Alan Taylor, CDP



The engineers of the industrial revolution were quite puzzled when, in the late nineteenth century, people started asking them to change the designs of their equipment to make it foolproof.

The engineers argued that governors placed on steam boilers prevented the system from working at peak efficiency and added to the cost. They pointed out that safeguards placed around saw blades added to maintenance downtime.

And in neither case had the equipment designers themselves done anything wrong – it was the damn fool users who stoked the boilers, put their arms in front of the blades, etc.

In time, this phase of the industrial revolution passed, and the engineers saw that providing a foolproof design was simply a part of the engineering job.

Some of the forces that helped enlighten them came from insurance companies – and these forces are being heard today by some computer users. Errors and ommissions policies are currently being withdrawn by some insurance companies.

So, let us look at the design of computer antierrors and ommissions systems – starting with the ones created by garbage in, garbage out (Gigo).

One of the cleanest examples of Gigo I have seen came in last week from a puzzled reader who had no theories as to why a $1.09 bottle of Calgonite that contained 2 lbs 3 ozs could have a unit price of 28 cents a pound. (See figure.)

Put that way, of course, the reason is not obvious. But, using a little archeology on what could have happened makes it clear there is the DP equivalent of a "hot spot" built into the system, and apparently the safety designers have not taken the best available precautions.

The reader who had no theories knew:

- The price information was wrong.
- The mistake tended to favor the person making the mistake, not the one reading the computer output.

In brief, the unit price printed was lower than it should have been and could be, therefore, positively harmful, not just irrelevant.

Tracing the Error

The error cause can be traced in a number of ways. For instance, just what weight package would have a unit price of 28 cents and a total price of $1.09? The answer isn't exact, of course, but it comes out around 3 lbs 14 ounces. No clues there. So where is the error?

Look again at the descriptive label in the figure. Note the way the "oz" is butted up against the "3." Does that give you any ideas? Is that "o" a letter or a number? Could the input have been a 2 lb 30 "z" descriptor?

That is clearly what happened. It was a Gigo error. And the input was what caused the output to be what it was. But, investigating the input was not the only way of finding the cause. There are a number of ways the system could have found the wrong input.

These, however, don't directly concern us at the moment. Rather than getting into ways in which the system design could have been improved, let us look at the:

- Cause of the wrong input.
- Stopping of wrong output.

The reason we should look at the cause of the wrong input is to see if there is anything particular about the case that can make this a general-expectable type of error, as opposed to a fluke. The reason we should look at the output is to see the easiest way of stopping the recurrence of these errors – for everybody's sake.

Input Inspection

The input error came from the confusion of the letter "o" and the number zero. A similar confusion will, potentially, occur every time the word after a number starts with a number-like symbol.

In particular, it will potentially occur every time the "lbs" abbreviation for pounds or any version of the word "ounces" occurs. Both of the words can start with ambiguous symbols.

Unfortunate, of course. Not the responsibility of supermarkets – but a cold fact of history which will not entirely go away even when we substitute liters for pints. It is and it will remain a DP hot spot. Errors are liable to occur here.

The function of the output review is somewhat different. The question is not the identification of the possibility of error, but identification of the fact of error. This is quite simple in the current case, but still not as simple as it looks to be.

On the surface, we can repeat the checks my reader used. Just multiply out the amount and the unit price, and then check it against the package cost.

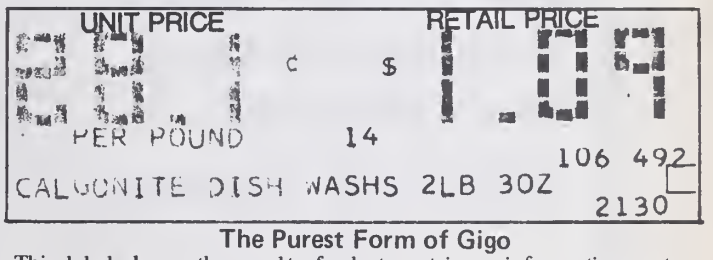
Unfortunately, this might not work.

If the field of the ounces number does contain the number "3," this method will find the error. But if it does not and, instead, contains the number "30," it will not find the error, but simply repeat the original mistake.

The reader, of course, did not repeat the mistake, because he knows there are only 16 ounces in a pound. His brain naturally rejected any field division of "30ZS" that would require a quantity of 2 lbs 30 ozs.

This human brain reaction gives us the clue to proper designing of output error control systems, so the insurance companies will consider DPers more favorably.

A test of the output that would have caught this is simply noting whether the ounce field was more than 16. That is not a complicated test and, in this case, would prevent the hot spot problem in all but one situation. As to what that situation is and how to correct it, I leave to you.



The Purest Form of Gigo

This label shows the result of a hot spot in an information system design, resulting in the publication of wrong information which favors the publisher (by understating the unit price of the product) rather than the reader. This article deals with methods of identifying and controlling such hot spots so even garbage input can be stopped from producing garbage output.

Educational Expertise Must Be Top Skill of DP Trainer

By Stuart J. Wallack
Special to Computerworld

G.D. Horne Jr. [CW, April 16] provided the panacea all DP trainers have been waiting for – making computer training a potential profit center. The approach is easy. Obtain top management commitment, hire highly skilled computer people with "the highest degree of credibility" as trainers and let your training staff become expert DP consultants.

Horne failed to take into account certain economic facts of life. The age of belt-tightening is upon us. For the past two decades, top management has put its faith in, as Harry T. Larson wrote, "expensive personnel – computer people – and they are still working far below achievable productivity . . ."

The pseudosophisticated schemes of highly skilled technical people are falling on deaf ears. Executives want pragmatism and accountability, not jargon and rhetoric.

Speaking of sophistication, "sophisticate" at the beginning of the computer age meant to alter deceptively, to adulterate. In computer nomenclature, the term has come to mean advanced or refined. In most computer applications, the former is more properly applicable.

Thus, when Horne spoke of staffing his training department with "a staff recognized primarily for its professional computing skills," I questioned whether his requirements are synonymous with sophistication.

My greatest umbrage is with Horne's subjugation of training ability as the primary criteria for hiring to the training staff. Certainly, any technical trainer must have a good grasp of the subject matter, but this must play a concommitant role to the instructor's educational expertise. I thought the days of the all-knowing pedagogue lecturing to a group of passive neophytes were a thing of the past.

While there are many computer practitioners and there are some excellent teachers, the two skills seldom coincide in one person. A professional trainer is concerned with developing meaningful course objectives, evaluating those objectives and selecting proper curricula and methodology for the course. Without these concerns, the educational effectiveness of a course could seriously be challenged.

I concur with Horne that DP trainers should also serve as consultants. There has been a paucity of this in the past. But post-course follow-up should deal not only with technical matters. Trainers should serve as consultants to managers and employees in designing a career development program for each employee.

As the role of the trainer is expanding, so is the time he must devote to activities. other than classroom instruction. The rapid change in computer technology makes curriculum evaluation and new course development a constant necessity.

The DP consultant who can increase the profitability of the business is a valuable commodity. And having trainers make training an investment rather than a cost by increasing productivity through more efficient and effective operations is also an asset.

Nevertheless, while trainers can and should consult and some consultants can and should train, trainers' top priorities should be related to educational endeavors.

Wallack is an information systems instructor at Western Electric's Corporate Education Center.

Reader Commentary

Letters to the Editor

A Partial Solution

There is at least a partial solution to Arne Rohde's problem of information retrieval in the computer field [CW, May 28].

Since 1971 we have published the *Quarterly Bibliography of Computers and Data Processing* which provides a subject and author index to all the major trade publications. It is specifically oriented toward the computer user as opposed to the engineer or researcher.

The computerized approach has been tried but is generally too expensive for all but the most well-endowed research libraries.

Our approach is less glamorous, but it works and it's inexpensive.

Phillip C. Howard
President

Applied Computer Research
Phoenix, Ariz.

'Ungentlemanly' Response

I was appalled by a pair of letters in the May 7 letters column. Charles Gies wrote a letter in rebuttal to John J. Hunter's March 26 article, "Rethinking Application Programs Key to VS."

Gies' letter was thoughtful, clearly expressed and nonhostile in tone. His only suggestion was that Hunter had been incorrect.

Immediately below this letter was a re-rebuttal by Hunter written in a very nasty way. Hunter offered no real defense, no factual background.

I feel that Hunter's letter was entirely ungentlemanly and that one might certainly expect more reason from a man who claims to be an expert in his field.

While I'm at it, I cannot let Herb Grosch's column in the same issue pass without comment. This particular column was entitled "Beyond 1984, Indeed." It consisted entirely of an emotional reaction, defending the "stored program" idea against a fellow named Stephen Wright who apparently had advocated the end of stored-program computers.

In the process, Grosch managed to strike out at all of the "extremists" who have some idee fixee in the computer field. That's O.K. But, in the process, to down the entire idea of firmware, software implemented in hardware and higher-level languages is a bit extreme in itself.

"Retaining the possibility of programming in a machine language" is marginally reasonable, but what can be wrong with upgrading the machine language? And for all of us who learned the hard way what a pain machine language is, what can be wrong with advocating more competent high-level languages? For heaven's sake, Grosch is becoming an anarchist!

L.F. Wygant

Schiller Park, Ill.

For Cooperative Users

'Speakeasy' Provides Escape From Complex Languages

By David C. Briery
Special to Computerworld

ARGONNE, Ill. – Once a refuge from the drudgeries of prohibition, the Speakeasy of today offers a refreshing alternative to frustratingly complex computer languages.

Speakeasy is a computer software system for people who consider their time more valuable than that of their computer. Most existing computer languages make efficient use of computers; historically, few languages have made efficient use of manpower.

Speakeasy began as a hobby of physicist Stan Cohen at Argonne National Laboratory near Chicago. Today, Speakeasy is almost self-supporting through a unique, nonprofit computer software cooperative.

The cooperative includes some 50 corporations and institutions such as the Schlitz Brewing Co., the Federal Reserve Board, Exxon and a number of universities.

To these users, Speakeasy provides an easily learned mode of access to vast amounts of information stored in computer complexes.

Through the Speakeasy Center at Argonne, cooperative users exchange information. The Center provides members with copies of its current processor and libraries. Comsat, for example, provided Speakeasy with a graphics package for obtaining output on Tektronix 4012 and 4014 terminals.

Today, increased technology allows more and more people economical access to computers. Unfortunately, not everyone has the time, patience or desire needed to learn conventional computer languages. Speakeasy can be grasped and used by a novice within minutes because it contains a vocabulary of standard English and understandable mathematical terms.

An Application Program Also

Speakeasy is not just a language. Speakeasy is an application program. It demands no special modifications to the operating system and can be installed in a few minutes. Operational on IBM 360 and 370 computers, Speakeasy runs under OS, VS, MTS and VM/370.

It plays its most powerful role, however, as a desk calculator used under TSO for an OS or VS environment – under CMS in the VM system or under MTS. The TSO version requires a minimum region of 140K for effective operation.

The Speakeasy user needs to know little about the digital computer and never needs be concerned with computer programming. One simply formulates a problem, and Speakeasy takes over.

Tutorial sessions built into Speakeasy teach the system to the novice, while on-line "Help" documents define the 450-word vocabulary. Words like TABULATE or GRAPH are part of the vocabulary. TABULATE X, Y is, for example, a command to Speakeasy to produce a table of previously calculated values of X and Y. Similarly, the command GRAPH Y:X will produce a picture of the same information.

The Speakeasy language processor has built-in array and matrix algebra capabilities. Performing a growing number of statistical operations, Speakeasy can also solve most problems in differential and integral calculus. Tabular and graphical capabilities are standard with TSO terminals, but the Tektronix 4000 series terminals provides a totally unique interactive graphics package.

How It Operates

Speakeasy works like this. If the user enters the problem "3+6," the Speakeasy processor responds "3+6=9." Then, if the user enters "ANSWER * 4," the process responds, "ANSWER * 4 = 36."

Speakeasy helps the user by pointing out errors in syntax or logic in a line-by-line dialogue. If the user enters the statement, "3 * (6," the Speakeasy processor responds with the error message "Parenthesis imbalance."

If there is an error, the user can correct it and immediately proceed with the next step in his problem. Speakeasy functions similarly through all mathematical levels, including differential equations and eigenvalue problems.

The true power of Speakeasy is its potential to enlist the help and expertise of its wide spectrum of users. The system's designers realized from the start that attempting to build all of Speakeasy's capabilities into a single processor would result in a hopelessly complex and tangled package.

They chose instead to plant a limited set of operations into the processor and enhance those operations with a network of attached libraries. As new areas of application are encountered, new capabilities are added to Speakeasy's extensible library.

The programs and information contained in the libraries comprise the bulk of Speakeasy's capabilities. The interconnection among libaries is an open-ended system, the processor itself often serving only as a communication module between libaries.

(Continued on Page 20)

Independent's Cobol Compiler Runs on 16K RDOS-Based Novas

EVANSVILLE, Ind. – A compiler that supports a subset of ANS Cobol '68 on any 16K Data General Corp. Nova running under RDOS is now available to U.S. users through Universal Computing Systems, Inc. (UCS) here, and to Canadian users through Windsor Computing Service, Windsor, Ontario.

Developed by Perseus Computing and Automation in South Africa, the compiler works in three stages, converting Cobol source statements to Assembler code in one pass, then running that through the normal RDOS assembly processor and producing a Save file with the Nova's loader and a Cobol library routine.

The Cobol system includes on-line data entry, data inquiry and verification. Random, sequential and keyed files are supported, and keyed files may be indexed at any level, UCS said.

Full ANS editing capability is said to be part of the package as well as backing for as many as three levels of subscripting. Decimal point alignment and sign control are built in. So is support for 14 digits of numeric display data, 48-bit accuracy for floating point numbers and 132 characters in an alphanumeric literal, the vendor said.

Within the procedure division, users may nest conditional statements up to 10 levels and PERFORM statements may be nested to any level, the spokesman added.

Full Range of Cobol Verbs

The compiler appears to accept a full range of Cobol verbs, clauses and optional statement constructions. It also provides extensions to the 1968 ANS Cobol standard, chief of which, according to UCS, is the capability to ACCEPT numeric data from the console keyboard.

A minimum configuration would consists of a 16K Nova, RDOS, a 512K-word disk and a console. Extra main memory will be used for the symbol and entry point tables, UCS noted.

The UCS package includes the compiler, a set of file utilities – including a five-key sort program and a report generator, both stand-alone – and manuals for both Cobol and the utilities.

The basic Cobol package costs $3,500 and will be shipped within 10 days.

UCS can be reached through P.O. Box 3597, 47734. Windsor Computing is at 9420 Tecumseh Road East in Windsor, Ontario N8R 1A4.

Accounting Work Now in RPG-II

MONROE, La. – Users with IBM System/3s or other environments utilizing RPG-II as a principal language have a new source of packaged applications and utilities.

Bancroft Computer Systems (BCS) is continuing development of a library of financial accounting packages, which already includes a general ledger system and accounts receivable processing runs, and a ledger system for real estate managers.

Inventory control and payroll systems are expected to be ready later this summer. All of the applications are designed to handle multiple companies in a single processing cycle, BCS noted, and the payroll system will calculate tax deductions for multiple jurisdictions.

Utilities currently available includes a gangpunch/reproduce routine for 96-column cards, a letter-printing system and a graphics package based on a line printer.

The general ledger package supports editing of transactions and file maintenance, all based on the user's own chart of accounts. Detail posting of transactions to individual accounts includes beginning and ending balances.

Output may include comparisons with prior year, departmental reports, budget analyses, trial balances and balance sheets as well as income statements.

Batch-Oriented Receivables

The receivables system is batch-oriented. It includes an error-handling routine using a suspense file, product analysis and 12 months of customer history in addition to preparation of monthly statements.

The application systems generally require a 16K System/3. Source code for the systems is distributed by BCS on System/3 disk.

The standard general ledger package costs $895, while the special ledger for real estate is available for $825. The receivables systems costs $995.

All prices assume the user sends a disk along with the order. There is an additional charge of $125 if BCS provides the disk, a spokesman noted.

The utility packages, on 96-column cards, vary in price from $90 for the gangpunch/reproduce to $475 for the line-graph printing routine, BCS said from Suite F, 1200 North 18th St., 71021.

Advocate Seeks Answer

Does Cobol's Report Writer Really Miss the Mark?

A Report Writer module was part of the 1968 American National Standards Institute specifications for Cobol and, in a rewritten form, is part of the 1974 standard as well. Supporters of the module are puzzled by users who deplore or ignore it or, even worse in the supporters' eyes, implementors who disregard the specialized programming tool.

Form of the Report Writer capabilities was largely left to the implementors in the 1968 standard. Developers now writing compilers to meet the 1974 standard might benefit from reactions to the accompanying viewpoint.

By William B. Simmons
Special to Computerworld

I would like to stimulate a discussion on the merits of the Cobol Report Writer module. In particular, I would like to know if anyone can explain the near-universal prejudice which exists against this very powerful programming tool.

My own inquiries have been met with a variety of explanations, such as the following, none of which sound very convincing:

- "Report Writer is inefficient." This is perhaps true for any generalized report-generating package. A custom-programmed job can usually take advantage of shortcuts that would be dangerous for a package. Yet, packages seem to do a thriving business on the basis of general reliability, ease of use, flexibility, etc.
- "Report Writer uses too much core." This is perhaps also true. Yet, it is another charge that can often be laid against the increasingly popular reporting packages. It is also interesting that I have never heard of any benchmark tests that would support this charge.
- "Report Writer is nonstandard." Interestingly, my IBM Cobol manual definitely does not list the Report Writer as an extension to the standard.
- "Report Writer is not supported by all manufacturers." This is a curious statement if the feature is indeed part of the standard. Yet, even if it were true, could not the same thing be said of most reporting packages? It may be rash to do this, but I will hazard the guess that Report Writer is now implemented on more machines than most of the popular package report generators.
- "Most programmers don't know enough about Report Writer to maintain it properly." This explanation is almost too ludicrous to take seriously. Is it more difficult to teach a good Cobol programmer more about his main language or to teach him an entirely new language having unfamiliar coding formats and processing restrictions?
- "I've never heard of the Report Writer." This is a surprisingly common response from managers and programmers alike. All it really means is they have never bothered to read their language manuals thoroughly. Still, it is probably one of the most honest responses I have heard.

It may well be the Report Writer is as bad as everyone makes it out to be. Perhaps it is actually better to teach programmers how to do their own control break tests, to set up switches for page overflow, to do group indicates on control fields, etc.

However, I have yet to see any arguments that would convince me this is so. On the contrary, I have the very strong suspicion the prejudice against the Report Writer is, like many other DP superstitions, based upon conditions that existed six or eight years ago.

If that be so, then it is time to take this dusty old feature out of the closet and see if it fits any better now than it did then.

Simmons is an independent consultant based in Montreal.

'R-Ten' Service Supports Distributors On-Line

DAYTON, Ohio – Wholesale distributors across a broad range of industries can have on-line order entry and inventory control capabilities, without the costs of acquiring and programming in-house hardware, by subscribing to the Reynolds Terminal Entry Network (R-Ten) service available through Reynolds & Reynolds Co.

The service is based on a Honeywell 6060 CPU in Pittsburgh, accessed at 30 char./sec over dedicated lines from GE Terminet 1200 terminals in the using companies' offices. Support for higher line speeds is currently being considered, the vendor said.

The system builds orders for the user based on input, including no more than customer number, product numbers and quantities being ordered. Working with user-defined files, R-Ten generates descriptions of the products in addition to customer name and address or addresses if separate "bill to" and "ship to" locations are required.

The shipping documents have items arranged in whatever sequence the user has previously defined, based most likely on the most effective picking order of the warehouse involved, Reynolds said.

System Notified

Although data for invoices is collected along with shipping data, invoices are not generated until the system has been notified as to what has in fact been shipped.

Heavy volume output, including invoice printing and month-end management reports, can be directed to a high-speed line printer at one of the six Reynolds data centers in cities in the eastern U.S. and Canada.

Since invoice forms tend to differ from company to company, the Reynolds invoice preparation programs are tailored to the R-Ten subscriber's specifications before service starts.

Other programs, generally printed on stock paper for internal use only, are parameter driven so the user can make modifications as needed.

Cost of the R-Ten facilities – not including the Terminal 1200 – varies with the size and complexity of the user organization, but a typical user, with 15,000 products, 5,000 customers and 200 order/day might spend $3,000/mo on the service, an R-Ten source estimated.

Restart Backed by Pansort 3.0

OAK BROOK, Ill. – Pansophic Systems, Inc. has begun to install Version 3.0 of Pansort, a high-speed sort/merge system that now includes capabilities missing from earlier versions.

Originally developed in Europe, Pansort runs on IBM 360s and 370s in OS or DOS environments. In operation, it requires only 12K of main memory, but cuts I/O time by as much as 80%, saves up to 30% of the sort work space on disk and reduces CPU time by at least 10% compared with IBM-supplied sorts, Pansophic said.

In addition to supporting all user exits available with IBM sort systems, including exits E-61 and E-32, Pansort Version 3.0 includes an optimized checkpoint/restart facility. It was lack of this particular facility that users saw as the major drawback in the earlier releases of Pansort, the vendor said.

Version 3.0 supports the Pansort access method or AM Option, a facility permitting multiple sort operations in a single pass of the input file.

The option is invoked by the user much like an embedded sort, but several sorts with differing parameters may all be running concurrently, again reducing overall run time, a spokesman said.

Sorting can be done in parallel mode, with multiple independent sorts of one file or in cascade mode with one sort overlapping the next. In either case, Pansophic said savings of 80% of sort time have been realized.

Perpetual licenses for Pansort are $6,500 for OS installations and $5,000 for DOS users. Maintenance after the first year is $600.

The system may also be acquired on an annual rental basis for $3,000 (OS) or $2,000 (DOS).

"For the time being," the AM option, originally an extra-cost feature, will be included free with all Pansort installations, the spokesman said from 1301 West 22nd St., 60521.

Cooperative Working With 'Speakeasy'

(Continued from Page 19)

If, in the course of breaking down a user's request, the processor encounters a word not defined in the processor, it then searches the attached libraries. If the word is found, the appropriate operation is "dynamically" loaded into the computer's memory to perform the function. Thus, each user community tailors Speakeasy to its own needs.

Speakeasy's simplicity not only permits the economical use of computer time and manpower, but minimizes errors in programming. As man relies more upon computers to handle the problems of an increasingly complex society, Speakeasy appears promising as a very simple but efficient way for man to communicate with his computers.

Annual membership fees for the Speakeasy Users Group is $1,112. Trial versions of the system can be made available for on-site evaluation. The Speakeasy Center is at Argonne National Laboratory, 60439.

Two-Tier DDS Tariff a Nightmare

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. – By the end of this month, AT&T's Dataphone Digital Service (DDS) may be totally mired in a two-tier rate structure that users will find completely incomprehensible.

It is difficult for the Federal Communications Commission (FCC), AT&T or anyone to explain to a user why he must pay double for a digital data service if he happens to be in a certain group of seven cities, when he could pay half the price if he were in another group of five cities.

And AT&T has only muddied the waters further by filing what it describes as an "interim tariff" that defies comparison with its initial rates in the first five DDS cities.

The five-city rate clearly broke down mileage rates according to transmission speed, so the user could figure out his monthly bill if he knew the mileage between the cities. But in its new proposed tariff, the mileage charge together with the service terminal charge has been "bundled."

The speeds of 2,400-, 4,800- and 9,600 bit/sec no longer have a different mileage charge, but have a flat rate regardless of speed. There are those who say the new DDS rate really boils down to 85 cent/mile per month plus $120 or $60 for the service terminal on each end of the line. AT&T rate engineers say this kind of analysis is not the correct way to look at the new tariff proposal, but they hesitate to say it is wrong.

The FCC will have to decide whether the new seven-city rate actually complies with a commission order of 1974 that required Bell to file rates no lower than existing private line rates. That order seemed clear enough.

Analysis

But, in the meantime, Bell raised its private line rates by 5.1% in March. So the latest tariff filing actually comes out lower than the private line rates, if the March increase is included.

So, for the real tariff freaks, the question is whether the FCC meant no lower than private line rates in effect now, before or when?

And if that problem isn't complex enough, AT&T has found another. The cost per month of a DDS Data Service Unit (DSU) has gone up from $15/mo to $50/mo. Why?

Well, apparently Bell took the cost of the lowest priced data set used at 2,400 bit/sec and said, "this looks like a good rate to include in the seven-city proposal." Is that a fair price?

Meanwhile, of course, the FCC is busy with its "paper hearing" designed to establish once and for all what a fair tariff for DDS really should be. And if this proceeding doesn't end by December 15, 1975, the interim seven-city rates will automatically expire, unless it is extended by the commission.

Clearly, the entire DDS rate structure will become a required case study for future law school students planning to specialize in regulation. But for the users who must decide whether DDS offers a capability they need, the tariff structure is a nightmare. A concerted effort by both the FCC and AT&T could not have confused the pricing any more.

It is really too bad DDS was hailed as a new technology designed for the data communications user. The reliability and other benefits claimed for this service have been completely overshadowed by a pricing scheme nobody wants and few understand.

If users, competing specialized carriers and equipment vendors complain loud enough to the FCC, perhaps the new rates will be suspended by the commission pending further study.

If regulation is designed to protect the public interest, then perhaps it is time to examine where the public interest really lies? It is very hard for any user to sift a constructive result out of the present tariff muddle. We hope the FCC will prove us wrong.

For International Operation

Compatibility Key to DRI Net Success

By Ronald A. Frank
Of the CW Staff

LEXINGTON, Mass. – The key to configuring a successful international data communications network is to make sure the equipment used on both ends of the system is compatible, regardless of who supplies it.

This may seem like a fundamental rule, but at Data Resources, Inc. (DRI) it has helped to operate a network which includes both U.S. and Canadian links. As part of its economic computational services, Data Resources has Canadian customers who access the firm's data base stored on four Burroughs B7700 processors.

Between Lexington and Montreal, the firm has AT&T 3002 private lines with C2 conditioning which operate at 4,800 bit/sec using Bell 208 data sets. Between the Burroughs DCP front ends and the 208s, the network includes a General Datacomm (GDC) 1202 time division multiplexer which has a capacity of 24 channels. A similar 1202 multiplexer is installed in Montreal by Bell Canada.

From Montreal, the 300 bit/sec channels fan out on the Canadian Dataroute to Toronto and Ottawa. The all-digital Dataroute links in each city terminate through GDC 103-type data sets to local loops connected to terminals at user locations.

Since Bell does not provide multiplexers in the U.S., the unit at the company in Lexington is leased for about $250/mo from GDC. The same multiplexer from Bell Canada installed in Montreal costs about $400/mo, according to Ralph De Ment, manager of telecommunications services.

Dataroute line costs up to 2,400 bit/sec in Canada generally are much less than U.S. analog lines, but the equipment is more expensive up north, De Ment said. But the higher equipment cost is modified if the user adds the availability of maintenance round the clock from Bell Canada and the fact it would cost about 20% import duty to bring comparable equipment into Canada, he said.

Most of the users served in Canada are government agencies, universities, private firms and financial houses. They access the Data Resources econometric data bases on the B 7700s in Lexington.

The connections are made by the user on a dial-up basis and most operate at 300 bit/sec or less in interactive mode. In Canada, users have Ascii terminals which include Hazeltine CRTs, Texas Instrument and Execuport portable units. In the U.S., users have IBM 2741s, 2780s and Burroughs TC 3500s for remote job entry operations.

In Canada, a Dataroute channel between Montreal and Ottawa costs $126/mo for the access arrangement, interexchange rate and the termination charge. A comparable distance in the U.S. under current high/low private line rates would be about $400/mo per channel, De Ment estimated.

In each case, about 100 hours of usage was used as a typical average. The total monthly bill for the Canadian net, including eight 300 bit/sec channels and the associated equipment, is about $2,500/mo, he estimated. While Dataroute has a 300 bit/sec rate, there is no comparable low-speed rate in the U.S.

Among the benefits of Bell Canada's service, De Ment listed the fact the user does not have to make any capital investment in equipment, the units are cancellable on a 30-day notice (like in the U.S.) and Dataroute channels are available in 60 days while the wait for domestic lines often can be longer. In general, the Canadian carrier has been very reliable and cooperative in working with him, De Ment said.

CW Photo by R. Frank

Ralph De Ment, manager of telecommunications services, checks network status on Burroughs CRTs.

AT&T Applying to Add DDS in 40 Cities

WASHINGTON, D.C. – AT&T has filed with the Federal Communications Commission (FCC) an application to construct digital facilities for 40 additional cities to enlarge its Dataphone Digital Service (DDS) network to a total of 64 cities. The carrier said it plans further expansion to 96 cities in late 1976.

Birmingham to Worcester

The additional cities, each of which can serve some surrounding communities, are: Birmingham and Huntsville, Ala.; Phoenix; Anaheim, Inglewood, Mountain View, Oakland (East Bay), Sacramento and San Diego, Calif.; Wilmington, Del.; Jacksonville and Orlando, Fla.; Indianapolis; Des Moines, Iowa; Louisville, Ky.; New Orleans; Springfield and Worcester, Mass.

Also: Omaha, Neb.; Charlotte and Raleigh, N.C.; Trenton (Hamilton Square), N.J.; Albany, Buffalo, Rochester and Syracuse, N.Y.; Akron, Cincinnati, Columbus, Dayton and Toledo, Ohio; Oklahoma City and Tulsa, Okla.; Seattle; Allentown and Harrisburg, Pa.; Providence, R.I.; Memphis and Nashville, Tenn.; and Salt Lake City, Utah.

At last. A system that puts transaction processing first. DECcomm 600.

Until now, transaction processing has been a secondary feature of most computer application systems.

Well, thanks to Digital, all that's changed.

Because now you can get a system that puts real-time transaction processing right where you want it.

Up front.

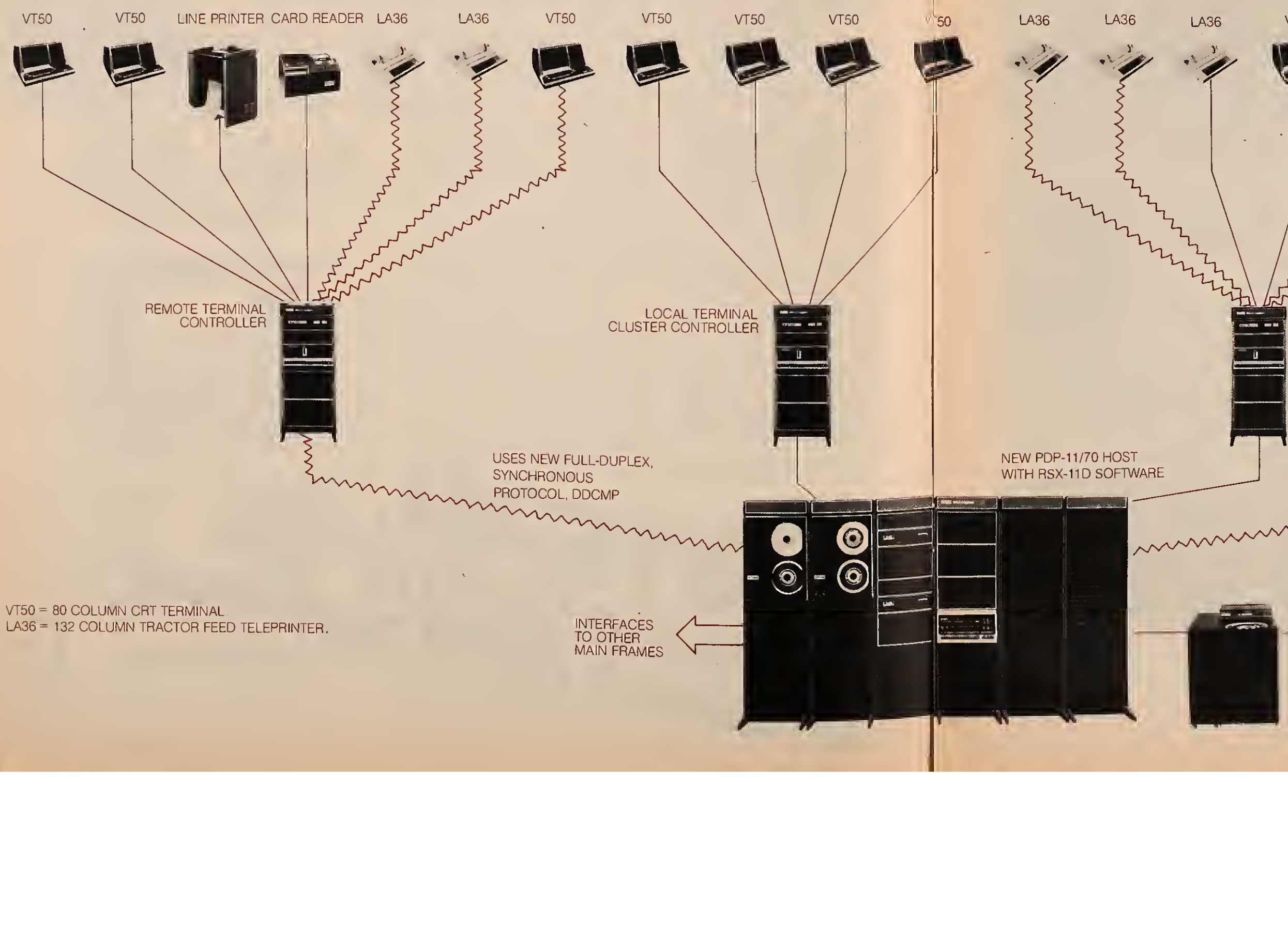
Where it can handle transactions from many terminals: CRT's, teleprinters, line printers, card readers, you-name-it. All of which can be mixed and matched anyway you want—whether local or remote—for high-volume, communications intense applications like the backroom of a bank, credit checking, insurance claims processing, remote order entry, distributed inventory control, reservation systems, etc.

We did it by extending the power of our real-time, data based RSX-11D system with a comprehensive hardware/software communications package.

DECcomm 600 uses a multiprocessor technique. Now communications interrupt processing time that would be required of RSX-11D is handled by a second processor, a concentrator, using a communications executive to maximize throughput.

Handling all the communications for RSX-11D frees it to do what it does best—real-time, interactive, and batch processing. Simultaneously. Whenever and wherever your transactions initiate, they're processed fast through applications programs using FORTRAN or MACRO. Plus COBOL for batch processing.

Up to four concentrators can be located anywhere in your transaction processing network for control of local or remote terminal clusters, remote batch entry or regional dial-up activity, and much more. DECcomm-600 is transparent to applications software, so programs are written as



HP Introduces 9882A CRT Subsystem For Use With Desktop Calculator

PALO ALTO, Calif. – Hewlett-Packard (HP) has introduced a version of its microprogrammed CRT terminal, designed as a subsystem for use with HP's 9830 programmable desktop calculators.

The 9882A CRT subsystem uses the Model 2640A CRT terminal and comes with 2K more memory than the standard Model 2640A and a special interface cable to enable it to operate with the 9830.

The terminal can be operated in either block mode or character mode for data entry applications. Hard copy, through a line printer or typewriter, is provided under control of the 9830.

The smart (dynamically allocated) memory can store more than 400 lines of data that are viewable 24 lines at a time. Eight special function keys for user-definable routines and a positionable memory protect are additional features.

The terminal generates characters with a 7 by 9 dot matrix in a 9 by 15 dot character cell.

Inverse video (black on white) is standard on the 9882, while blinking, half bright and underlining are available as options. Lines that have rolled off the screen remain in memory and can be viewed by the user via roll and page keys.

The 9882 comes with 3K bytes of memory, which is expandable to 8K bytes in 2K or 4K blocks.

The terminal can transmit one character or a block of characters at a time. Asynchronous data transmission of Ascii characters is RS-232C-compatible at a fixed rate of 2,400 bit/sec.

Price of the standard 9882A CRT subsystem, including 3K bytes of memory, is $4,675. Prices of other configurations range from $4,150 to $4,800, depending upon options chosen. Deliveries will begin in August.

Xerox IDS Supports 12 CRTs

EL SEGUNDO, Calif. – Xerox Corp. has introduced a programmable interactive display system capable of supporting up to 12 intelligent display terminals.

The Intelligent Display System (IDS), which is composed of a microprocessor and one or more display terminals, provides inquiry/response and data entry/retrieval capabilities for Xerox CPUs.

The IDS will receive and format messages from a host computer, automatically perform the necessary control interactions and check the validity of received information, the company said.

A typical system, including the microprocessor and eight display terminals, has a purchase price of $35,100. A one-year lease price, including maintenance, is $1,060/mo. Deliveries are scheduled to begin in the second quarter.

Terminal Transactions

Timeplex Adds Calling Device

HACKENSACK, N.J. – Timeplex, Inc. has introduced an automatic computer calling unit.

Designated the Model CCU 11, it can be customized to meet the specific requirements of a particular data communications system.

While the CCU 11 is a Bell 801 replacement, it can do a great deal more. In addition to the standard 801 features, the CCU 11 also provides for multiple dial tone operation, call progress indicators, built-in Bell-type 103 or 202 modems, optional serial dialing interface and optional calling line selection.

Desk or Rack

All features can be obtained in either a desktop (stand-alone) model or in a rack-mounted card model.

These units are designed for system applications such as computer-controlled polling of remote terminals, automatic message distribution to lists of telephone subscribers and computer backup of dedicated private line facilities. Price for the basic card model is $425 and $600 for the stand-alone unit. Delivery is 60 days from 100 Commerce Way, 07601.

System Reduces Cost of Delinquent Account Notices

BURLINGTON, Mass. – Through a blending of electronics, communication lines, computers and the U.S. Postal Service, a major oil company has reduced the cost and increased the speed of sending notices to delinquent accounts among its 6-1/2 million credit card holders.

The oil company, which operates credit offices in Houston and Atlanta, pioneered the development and use of key-to-disk data preparation systems for preparing notices sent by Mailgram, a service of The Western Union Telegraph Co.

A tape is prepared off-line on an Inforex 1300 series system and taken to any one of 27 regional Western Union acceptance points for transmission to the Mailgram message-switching center in Middletown, Va.

The system, with the proper communications adapter and data set, can also be used to prepare the Mailgram messages and transmit them directly to Western Union at a savings of at least 10 cents per Mailgram.

Because of recent rate increases, the rate for sending a Mailgram directly to Western Union from any location in the U.S. is 90 cents each with a minimum charge of $75 or 85 Mailgrams. For those Mailgrams processed through a Western Union acceptance center, the rate is $1 each with a minimum charge of $250 or 250 Mailgrams.

Not only is the direct communications method less costly by 10 cents per Mailgram, but the minimum required number of Mailgrams to be sent is almost one-third.

The savings generated by this lower rate for direct transmission of Mailgrams can more than offset the estimated costs per month in additional rental charges for an Inforex communications adapter and a Bell Model 201A data set.

With this equipment, the user also can communicate with other similarly equipped Inforex systems or with compatible binary synchronous devices.

Mailgrams can be prepared and sent in three ways:

- Voice-originated, in which a person telephones Western Union toll free or visits a local Western Union office and provides the message and address information.
- Terminal-originated, in which a teletypewriter such as Telex or TWX is used to prepare the messages and addresses and then to send this data to the Mailgram message-switching center in Virginia.
- Computer-originated, in which a data preparation device such as an Inforex 1300 series system or a computer is used to prepare the text and hundreds of addresses.

Previous to its switch to the key-to-disk system in the summer of 1973, the oil company was using a Telex teletypewriter machine in its Atlanta center to prepare and send Mailgrams to its delinquent account customers. This process was more time-consuming and more costly for large volumes of Mailgram messages.

A spokesman for the oil company said using Mailgrams to notify delinquent customers is an "effective means of communications. It does get results." He said by using a 1300 to prepare the computer-compatible tape that "we are able to hold our system open longer each day so more notices can be prepared and sent. The whole thing is a one-pass operation and is done much faster than with the teletypewriter."

Because of the information storage and retrieval capability of the Inforex system, the oil company stores six standard notices on the disk unit of the system. In the preparation process each day, delinquent accounts are grouped according to the type of Mailgram notice to be sent. This group of names, addresses and Zip Codes, plus a code number for the type of notice to be sent, then is sent to the Inforex operator.

The key entry operator, in preparing the computer tape, needs only to type in a code number for the type message to be sent and then type the names, addresses and Zip Codes of those to receive the message.

After all Mailgram data has been prepared, a computer-compatible magnetic tape is produced by the key-to-disk system in the format and style required by Western Union.

This tape, which can be up to 2,400 feet in length and contain 10,000 names and addresses, is taken to a nearby Western Union acceptance center. There the tape is loaded on a Digital Equipment Corp. PDP-8 computer and sent over communications lines to a receive-only PDP-8 in Middletown, Va.

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Bits & Pieces

Ribbon Reinker Unit Added by Burroughs

ROCHESTER, N.Y. – Burroughs Corp.'s computer line printer ribbon reinking system provides computer room cost savings by reinking used ribbons three or more times. Nearly all major manufacturers' high-speed printer ribbons can be used.

The system is a self-contained table-top unit in which the entire reinking process takes place automatically under closed cover in approximately eight minutes.

The operator inserts the used ribbon, closes the cover and pushes the "process" button to reink. The machine operates unattended and shuts off automatically.

The machine automatically realigns skewed ribbons and rewinds with tension control to bring the ribbon back to its original outside diameter. It has a scraper blade that eliminates paper dust from the used ribbon.

The on-site ribbon reinking system is available for leasing (maintenance included) for $50/mo and $3 per ribbon reinked. The firm can be reached through P.O. Box 910, 14603.

Kybe Enhances Tape Testers

WALTHAM, Mass. – Kybe Corp. has made several functional and technological enhancements for its TMS-70 and TMS-77 magnetic tape testing systems.

The enhancements, which will be incorporated into all new units or which are available as options, are intended to simplify the operator's job and to increase the prevision testing capabilities of the machine.

Among the TMS-70 enhancements are:

- A blade life indicator dial and lamp that tells the operator when the cleaning blade needs replacement.
- A presettable footage search that automatically advances tape to a specific footage. This capability reduces the time required to locate and correct defective sections of tape. (Available as a $150 option.)
- A gross error indicator that alerts the operator when it detects a continuous error condition on more than 52.5 feet of tape. This feature enables operators to take corrective action before the defective tape causes an abort on IBM 360/370 systems. (Available as a $125 option.)

Among the TMS-77 enhancements are:

- An edge condition counter/printout that automatically detects and records dropouts occurring on edge data channels. (Available as a $350 option.)

Kybe is at 132 Calvary St., 02154.

GCC Provides Backup

Disaster Plan Minimizes DP Downtime

By Patrick Ward
Of the CW Staff

CHICAGO – If fire or major downtime knocked out DP at F.W. Means Co. here, billing and deliveries from 26 remote marketing offices would quickly grind to a halt.

To prevent that, the linen supply firm has set up an effective backup procedure "without redundancies or duplication of expenditures," according to Thomas J. Adrian, manager of Management Information Systems.

The firm entered into a $500/mo guarantee agreement a year ago with Greyhound Computer Corp. (GCC), from which it leases its two IBM 360/40s. The contract stated that, in case of emergency, F.W. Means would get full access to a 360/65 at a nearby GCC data center and would be up and running there within a maximum of four hours.

Backup is vital, Adrian said, since the 360/40s contain the complete company information system, including the route accounting system that tells the marketing offices how much to bill their customers and how much product to supply.

The marketing offices transmit orders and customer file maintenance information to the data center over off-line NCR Corp. and Tally Corp. key/tape equipment using dial-up Wats lines.

The data center then produces permanent customer records from the data as well as the invoices and picking orders which it retransmits to the marketing offices for printing.

The 23-hour processing cycle runs on a total of three partitions in the two 128K 360/40s under DOS. Each system has four tape drives. Both systems share eight spindles of 2314 drives.

If the route management processing schedule for any one location slips by four hours or more, customer service would be affected, Adrian said.

F.W. Means "disaster master plan" is designed to make sure the company's DP staff can leave its own data center and have its systems up and running at GCC well within this four-hour limit.

Emergency Procedure

The first priority, of course, is to get out of the computer room and, if possible, take the tapes for that day's processing.

These tapes are in 23 mobile bins, each of which contains about 12 reels of tape, Adrian said. The company also has a tape image of all the system software needed for the 360/65 close at hand.

Tapes containing the previous day's data are in a next door bank vault. The past month's data is stored in a more distant bank. There are copies of the system software tape in both banks.

If an emergency did not leave enough time for the DPers to take that day's tapes with them, the staff could simply do a repolling from a company marketing office designated as a backup location, Adrian said.

The key-to-tape equipment there would have only half the company's normal polling capacity, he said, but the disaster plan's preassigned jobs include staffers driving to in-state marketing offices to pick up tapes.

The company van would then carry the tapes from the company's backup headquarters to GCC.

Distant Drills

F.W. Means goes through an announced disaster drill twice a year "on days when the president wakes up and feels like one," Adrian said.

In its fastest time so far, the company DP crew had its systems up and running at GCC only 45 minutes after the disaster alarm sounded in their own shop, Adrian said.

In both trial runs so far, the GCC center handled F.W. Means processing for 24 hours, Adrian stated. The single 65 there can process F.W. Means priority systems almost as quickly as the two 40s handle normal work levels, he said.

Some people have, indeed, asked him why F.W. Means doesn't have one 65 rather than two 40s at its own DP center, Adrian remarked. The answer again is backup protection, With two machines, F.W. Means feels it can absorb minor downtime on one CPU, while the other continues processing, he said.

Independent Equipment Cuts Judicial System Time, Costs

DENVER – The State of Colorado Judicial Department has managed to speed up service on its IBM 370/135 as well as cut costs in a recent move to independent peripherals.

The predominantly on-line system, supporting remote terminal communications between the computer and the various court clerk offices and attorney general's office was enhanced with the installation of an independent's magnetic disk drive and telecommunications control subsystems.

The Memorex subsystems – a disk subsystem that bypasses the integrated file adapter of the 135 and a 1270 terminal control unit – are said to have eliminated the use of related control functions formerly integrated in the 370/135 circuitry, thus diverting central processor cycle time from housekeeping or control functions to judicial DP.

In addition, mixing the independently produced Memorex equipment with the 370/135 has lowered the department's net rental cost for both peripheral systems; speeded access to disk-stored information by 10%; improved the monitoring of subsystems operation; allowed for greater future expansion, if required; and cut the computer's response time to terminal-initiated requests by an average of 67%.

The Memorex 1270 terminal control unit, used by the department to control communications between the computer and 43 CRT display units, eliminated the use of an integrated communications adapter (ICA) with the 135. Again, machine cycles are freed.

Rental Down

Despite the extra external control unit, net rental is down slightly. The average response time for data to appear on a terminal once a request is keyed is down from 15 seconds to five seconds.

Terminals have been in use in court clerk offices since late 1973.

Data from alimony and support checks received at a bank's lock box are recorded on tape and sent to the judicial department DP center. After aging to assure quality of receipts, a payment tape is prepared and delivered to a Denver bank where alimony and support checks are written on a state account.

Since the computerized system reduces the bank check receiving-payment process to an automatic routine, their services are provided without extra charge in return for the float.

As a by-product of the on-line data base, phone inquiries from alimony recipients regarding status of payments are quickly answered by reference to video display terminals. Despite increases in the state's "alimony business," with the computer inquiry system, three people handle more work than five were able to handle previously.

Also, the alimony and support system has eliminated a $1,000/mo computer in one district court. Nine district courts, representing the state's most populous areas, will soon house the automated

(Continued on Page 28)

Survey Finds IBM-Compatible Drives Satisfy Users

DELRAN, N.J. – Most users of IBM-compatible magnetic tape drives are well satisfied with their overall performance and ease of operation, but many assign lower ratings to the drives' reliability and the associated maintenance service.

These conclusions resulted from a user survey reported in *All About Plug-Compatible Tape Drives,* a newly updated, 21-page report available from Datapro Research Corp. for $10 per copy.

Combining the ratings assigned by 126 responding users on the basis of their experience with a total of 1,328 IBM-compatible tape drives yields the following profile of overall user satisfaction:

	Excellent	Good	Fair	Poor
Overall performance	44%	36%	18%	2%
Ease of operation	56%	38%	5%	1%
Hardware reliability	38%	36%	17%	9%
Maintenance service	37%	38%	19%	6%

Datapro went on to explain that, even though tape drives are a more cost-effective medium for most file update processing, there are several reasons why disk pack drives have attained a dominant position over tape drives.

Reasons for Dominance

First, file updating plays a "less dominant role in data processing now," the firm said.

Applications which use the information base represented by a data file for other than detail and summary reporting of transactions as files are updated are not easily implemented with magnetic tape.

Furthermore, single item inquiry or selective report generation often cannot wait for the next update run, the firm explained.

In addition, extensive system software support requires something besides the sequential access mode in which magnetic tape can function efficiently.

Right now, that random access is provided by disk units, and usually by removable pack disk drives, Datapro said.

More Convenient Maintenance

Another important factor weighed against tape drives is disk packs provide a recording medium that is more convenient to maintain in good condition, the firm added, and this factor heavily involves human nature.

For tape operations to function effectively, constant vigilance is required to keep the magnetic tape itself in good condition.

"Installations that have large tape libraries measuring in the thousands of reels report that daily attention needs to be given to maintaining drive adjustment and tape cleanliness," Datapro said.

These users report the use of wrap-around hanging seals and self-loading cartridges are very helpful in maintaining cleanliness, and the use of outside services for cleaning tapes has also been mentioned favorably, the report added.

Even if less attentive care results only in skipped areas on tape, rather than data loss, much of the efficiency of high performance drives can be lost through multiple retries and space loss. Such attention requires manpower that seemingly might be better used in other areas, Datapro said.

And human nature is such that proper tape care is often eliminated in the interest of developing new applications.

On the other hand, the report continued, disk storage requires less attention. "Performance degradation, although present, is not so evident as with magnetic tape. Convenience is a powerful incentive to going entirely with disk units which are usually required anyway to accommodate new applications and systems software," Datapro said.

What makes the disk/tape comparison more than an academic exercise is the existence of large tape libraries in many organizations. Conversion costs in terms of machine time, manpower and media are substantial, the report said.

"Tape drives will continue to be with us for some time to come and, while they are around, many vendors will provide attractive alternatives to the mainframe vendors own offerings."

The report provided individual user ratings of independent tape drives as well as detailed specifications.

System Time, Costs Cut With Equipment From Independents

(Continued from Page 27)

alimony and support system.

Because of the judicial department's computerization, Colorado probably has one of the country's most unbiased jury selection systems. Voter registration files are one of the sources for the jury selection system.

Updates to the voter registration lists are made continually throughout the year on an on-line basis. County offices are provided voters lists quarterly.

Computer controls eliminate the possibility of the same person registering in more than one election. The prior, yearly-punched card registration system, a substantial peak load, was contracted to a service bureau.

Among the data bases now established are:

- Court System – for name index calendar and Register of Actions.
- Alimony and support.
- Registry, fees and fines.
- Bonds.
- Probation.
- Jury selection.

Grumman Introduces Printer Controller

WOODBURY, N.Y. – Grumman Data Systems Corp. has introduced a switchable model controller that permits the IBM 1403 printer to be used alternately with two different computers.

The Grumman G1403 series printer controller links the 1403 printer to non-IBM computers, and now a second computer interface can be added to the system. The single printer controller can then be operated with either interface by actuating a front-panel control switch.

No program change to either computer is required to operate a 1403 printer with the system, the firm said.

The system sells for $22,000 or leases for $640/mo (including maintenance) on a minimum one-year lease.

The firm is at 45 Crossways Park Drive, 11797.

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Data Communications

Course #1010 –

Practical Data Communications Systems and Concepts

This course will give you the information you need to master the newest developments in Data Communications. Led by the nationally recognized teleprocessing consultant, Dr. Dixon Doll, the course covers recent changes in areas like SDLC. HiD-LoD, DDS, newly approved major revisions to WATS, and the impact of satellite carriers. This seminar runs two days, and total cost, including workbook, reference materials, luncheons and continental breakfasts is $350. Additional registrants from the same company qualify for a reduced rate of $300. Current schedule is as follows:

Orlando – Jul. 2-3

Course #1020 –

Advanced Teleprocessing Systems Analysis and Design

This course is a follow-up to Course #1010, with special emphasis on problem solving techniques for minimizing operating costs in commercial data communications networks. Also led by Dr. Dixon Doll, the course covers procedures, approaches and algorithms for evaluating and cost-optimizing network organizations.
This seminar runs three days, and total cost, including an extensive set of customized course materials, luncheons and continental breakfasts is $450. Additional registrants from the same company qualify for a reduced rate of $400. Current schedule is as follows:

Los Angeles	June 16-18
Miami	December 1-3

Data Base Design

A practical approach to the design, implementation, and maintenance of data base systems.

Effective data base system design requires both a complete knowledge of the facilities provided by a data base package, and a basic understanding of the mechanisms which can be employed to construct data base systems In fact, the former is of questionable value without the latter

This course is a package independent examination of the techinques required for the design of effective data base systems The topics covered include

- *Effective Record Design*
- *Physical Storage Techniques*
- *Optimum File Organization and Indexing Techniques*
- *File Integration*
- *and much more*

Given in association with Leo J Cohen and Performance Development Corporation, this course reinforces the lecture matenal with workshops, in which attendees apply the techniques. just learned, to practical problems

You should attend this seminar if you are (or will be) involved in the design and/or implementa tion of a data base system and whether as a Data Base Designer, Planner or Analyst

This course runs for 3 days and costs $350 , including course matenals, continental breakfasts and luncheons Additional registrants from the same company qualify for a reduced rate of $300 Current schedule

New York	September 22 - 24
Denver	December 1 - 3

Legal Tools for Computer Contracting & Protection

A seminar that gives you the legal tools you need for effective negotiations, agreement drafting, warranties, security, tax planning and software protection.

The impact of the law is felt in virtually every aspect of the computer industry, and you need to know how to apply the legal rules in a positive way to increase you advantage in dealing with vendors that supply your installation. This course teaches you how to avoid the legal pitfalls that can be costly and embarrassing to you.

Under the personal instruction of Roy N. Freed, a nationally known lawyer, author, educator and expert in the field of Computer Law, you'll learn how to protect your interests in subject areas like these: Negotiations, Contracts, Warranties, Avoidance and resolution of disputes, Security, Fraud, Taxation, as well as Techniques in handling any transaction. And practical discussion and review of your own contracts is an added feature of this seminar.

You should attend this seminar if you are involved in contracting for the use of computers or computer services–whether as a Corporate Executive, DP Manager, Contract Administrator, Consultant, Inside Counsel, or as a Private Practitioner involved with clients who use computers. Cost for the entire 2½ day seminar, including continental breakfasts, luncheons, and complete resource materials is $325. Additional registrants from the same company are charged only $275. Current Schedule:

New York	October 22-24
San Francisco	November 12-14
Chicago	November 22-24

Performance Evaluation and Improvement

A seminar actually designed to save your installation money.

This course starts with a discussion of questions and specific problems attendees have about system performance at their own installation. Then step by step each attendee will learn the methodology necessary to understand the problems and implement the answers. The techniques presented at this seminar are in effect at numerous installations today, and have extended the life of one S/360 for more than two years – a savings, at last estimate, of more than $700,000 for one user.
Our course leader is Saul Stimler. His book, *Data Processing Systems: their performance, evaluation, measurement, and improvement,* will be an important part of the seminar. As well as case studies, topics that will be covered include:

- *Criteria for quantifying performance*
- *Pencil and paper analysis of a system*
- *Benchmarking techniques*
- *Realtime, batch, and interactive time sharing systems*

You should attend this seminar if you are a data processing professional or corporate executive whose responsibility it is to plan, benchmark, evaluate, or improve data processing systems.
Cost for the entire seminar, including continental breakfasts, luncheons, and all course materials (including a copy of Saul Stimler's book on the subject) is only $250.
Current schedule:

New York	September 29-30
Washington, D.C.	October 20-21
Chicago	October 27-28
San Francisco	January 19-20

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You should attend this seminar if you are actively engaged in the development of software systems. You should have experience in the use of PL/1, FORTRAN, COBOL, or an ALGOL-like language.

Cost for the entire seminar, including continental breakfasts, Luncheons, and all course materials is only $300. Additional registrants from the same company qualify for a reduced rate of $250.

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The Hewlett-Packard 3000 is a minicomputer?

"The 3000 a minicomputer? I think calling the 3000 a mini is an abomination!"

When we asked Mr. Thomas Harbron, Director of the Computing Center, Anderson College, Anderson, Indiana, what he thought about the HP 3000, he had some very interesting things to say:

"We're using the 3000 for administrative processing, academic work and some commercial work. We have 27 terminals and we selected the 3000 because we wanted a system that would provide us with remote access and would do general purpose types of things from the terminals. The 3000 allows us to do many different things at different terminals. In fact, it does everything we expected it to do and was the only machine we could find in its price class that would. I'd recommend the 3000 to others. It's a powerful and versatile machine. And it's cost effective as well. It's half the price of anything that comes close to it."

"I don't think that Hewlett-Packard ought to call the 3000 a minicomputer. It is a complete medium-sized system."

That's what the EDP center manager of an aircraft manufacturer said about the 3000. He also had this to say:

"One primary reason we bought the 3000 was to collect and analyze radar development data. The problem is that we have to collect data fast enough, pipe it to a computer, analyze it, and then make the necessary instrument adjustments. HP's 3000CX was the answer. We also bought it for its interactive capability. Very significantly, in our acoustics department we had to have the ability to turn around data analysis fast. The 3000 has been a real cost saving computer for us. For the last two years I was the entire staff for the 3000. Not a great deal of detailed knowledge of the system is necessary. Technicians can use it without much training. I'm very much sold on the 3000. And it's definitely a complete system—not a minicomputer."

"It allowed us to run eight times the volume at a third the cost. No minicomputer could do that!"

The above statement was made by the corporate banking division EDP manager of a major California bank. He also said:

"We've had the 3000 for over nine months. A year ago we were on a time-sharing system and the cost became prohibitive. We contacted six different companies to look over and bid on a proposal that defined our needs. HP was the only one that could handle our total application of management information for the Corporate Banking Division. The 3000 is not just a mini—it's much more. We're constantly amazing people here with what we can do. It's not hard to operate, not hard to cope with. But our favorite topic is that we're paying less than one third of what we were paying and running four times the volume. And this year, we'll double our volume again. That's eight times greater and less than one third the cost.

That's really productivity!"

"We found the only thing mini about the 3000 was its price."

When we asked the EDP center manager of another major manufacturing company about the 3000, that was what he had to say. He also had this to say:

"Our computer needs include both scientific and commercial applications. We were phasing out our teleprocessing terminal and our Environmental Monitoring Division's computer. So we started looking. We spent several months studying computer systems, and rated them on speed, versatility and ease of operation. The result of our study showed that the HP 3000 provided these requirements and had the best cost/performance ratio. We didn't fully realize the potential of the 3000 until we started programming it. We have experienced a significant cost savings in the seven months we've had the 3000 and we expect a greater savings in the months ahead. We really like the interactive CRT for programming and data input. Being a multi-programming system we can have many users on at the same time. The power and speed of the 3000 is equal to a large machine. It's no mini. Calling it the Mini DataCenter is more accurate. I'd definitely recommend the 3000 to other potential users. In fact, we already have. We feel they would be money ahead."

We're glad these and other users of the HP 3000CX set us straight. We called it a minicomputer because its state-of-the-art technology lets us sell it for a minicomputer price. From now on we'll call it a Mini DataCenter.

We want you to get the whole story. Write us for your copy of our HP 3000CX Mini DataCenter booklet. We know you'll find it interesting, informative, and maybe a bit surprising.

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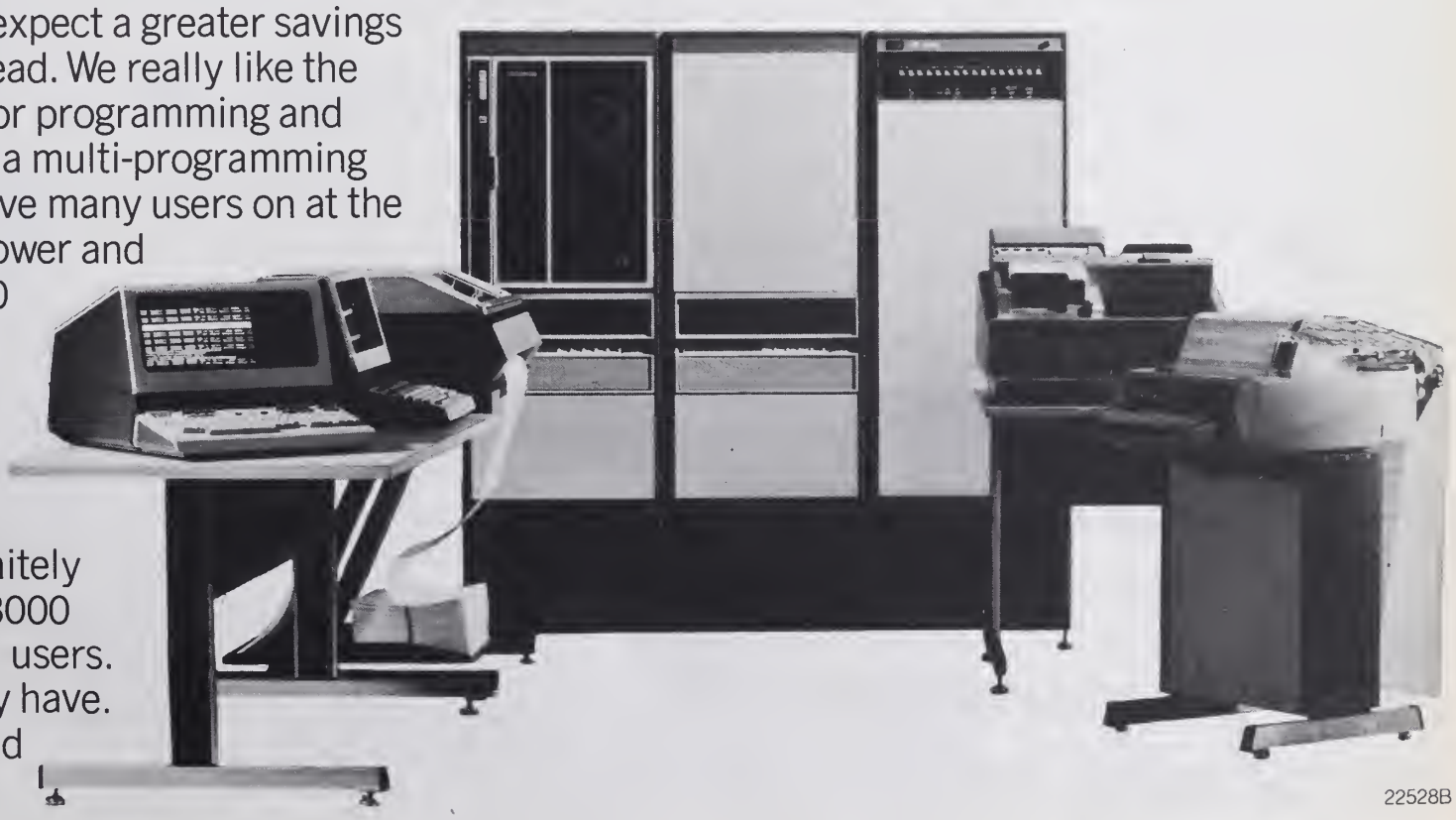

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Mini Bits

Tally 400 Line/Min Printer Called Price-Competitive

KENT, Wash. – Tally Corp. has introduced a 400 line/min printer it said is price-competitive with 300 line/min machines presently on the market.

An extension of the Tally Series 4000 line of comb matrix printers, the Model 4400 is a 132-column comb matrix impact printer.

Designed to provide high-volume print runs for minicomputers, small computer business systems, data entry systems and batch terminals, the printer handles a variety of pin-feed, multipart forms from 4 in. to 19 in. wide.

Features include a choice of a two-, eight- or 12-channel VFU; 20 in./sec slew speed; snap-in ribbon cartridge; switch-selectable six- or eight line/in. spacing and adjustable forms control.

Available as a desk-model or a floor-mount console with integral paper handling, the printer requires no preventative maintenance except routine cleaning, the firm said.

Depending on configuration, the Model 4400 will sell from $3,500 to $6,000. Interfaces are available for most popular makes of minicomputers or to emulate other line printers. A serial data communications interface is available as well as a standard Tally interface.

The firm is at 8301 S. 180th St., 98031.

Pertec Introduces Floppy Drive

CHATSWORTH, Calif. – Pertec Corp. has added another flexible disk drive to its product family, designated the FD500.

The drive has an AC motor and a two-state door with lock-out capability.

The drive is compatible with data written on IBM 3540 or 3740 systems, and data recorded by the FD500 can be read by either system, the firm said.

Using an IBM "diskette" or equivalent medium, the FD500 stores up to 3.2M bits of unformatted data and transfers data at 250,000 bit/sec.

Among the FD500's features are a locking door that is prevented from being opened when the drive is reading or writing data and a ferrite head that is fully retractable from the media under program control to extend head and media life.

Other features include special I/O adapters; cards for daisy chaining, including a device address switch; data separation; and index separation adapters.

Pricing for the FD500 is $650 from the firm at 9600 Irondale Ave., 91311.

Extends Series L Offerings

Burroughs Adds Three Business Systems

DETROIT – Burroughs' Corp. L 9000 series of business minicomputers are said to provide double the throughput of the current L series and "instant maturity" of both systems and application software.

The three models in the new series are the L 9300 and L 9400 accounting minicomputers and the L 9500 magnetic record minicomputer.

Because Series L systems are upward-compatible, users can utilize the increased power of the L 9000 series as their requirements grow, while protecting their investment in the application program products they are currently using, the firm said.

All three models have the Burroughs' 60-char./sec matrix console printer, which has a positioning speed of 330 char./sec.

Intelligent bidirectional printing is a feature of the L 9000 that further enhances throughput. The L 9000 calculates the most efficient print direction of each line of print, and, based upon this calculated direction, the print head seeks the first significant character, regardless of location, at maximum positioning speed.

A 32-character print buffer and 32-character keyboard buffer also contribute to achieving system throughput by permitting simultaneous operation of keyboard input, printing and processing.

Burroughs L 9000

The L 9000 has the ability to accept input from magnetic tape cassettes containing preaudited data recorded by Burroughs audit entry systems.

The L 9500 features the use of a magnetic record feeder/stacker which automatically feeds records into the system's console for reading, updating and restacking. The use of the feeder/stacker eliminates manual handling of the memory records and further increases system throughput up to 25%.

A library of Burroughs application program products is available for use with the L 9000 as well as all other L series systems. These include a wide variety of business management systems (BMS) for some 130 different lines of business, including various types of wholesaler/distributors, contractors, manufacturers, insurance companies, banking and the thrift industry, among others.

Series L application program products developed by Burroughs are written in Cobol. The BMS program products are fully transferable from system to system when users move to more powerful Series L models, the company said.

The L 9300 has a 15-1/2 in. wide front-feed forms handler; the L 9400 and L 9500 models have a 26-in. front-feed forms handler.

The memory of the L 9000 series is expandable to 64,000 bytes in 2,000-byte increments.

To increase system versatility and management reporting capabilities, the L 9000 systems offer a variety of magnetic input/output peripherals, a choice of wide-line printers and data entry and display units.

The L 9000 series models can be adapted to powerful on-line terminal computers at the customer's site through addition of data communications capability, the company added. As terminal computers, they can communicate with other Burroughs terminal computer systems and with Burroughs or other central computer systems.

Purchase prices for basic L 9000 models range from $16,990 to $26,990. Comparable monthly lease prices for basic L 9000 models range from $577 to $862.

Peripherals, input/output subsystems and memory-size options are in addition to basic systems prices.

Telefile Low-Cost Disk Controller Interfaces Drives, 16-Bit Minis

IRVINE, Calif. – Telefile Computer Products, Inc. has a disk controller it claims makes large moving-head, removable media disk systems price competitive with cartridge disk systems, yet they can store up to 15 times more data.

The controller is said to interface any of the latest low-cost, compact disk drives recently announced by Control Data Corp., Ampex Corp., California Computer Products and others with such 16-bit minicomputers as the CDC 1700 series, Digital Equipment Corp.'s PDP-11, the Honeywell H-16 series, Hewlett-Packard's 2100 series and other popular minicomputers.

Up to four disk drives can be directed by a single controller, providing users with 12.5M to 160M 16-bit words of storage capacity.

The controller has simultaneous seek, defective track relocation, 512-byte buffer and multiple-record transfer capability.

In addition, it takes advantage of all drive error detection features such as offset positioning and data strobe controls, the firm said.

Interlaced sector capability allows the interface between fast transfer drives and slower minicomputers. A search and read command allows the CPU to put from one to 256 key words into the controller.

The controller then searches the disk sector until it finds its matching word(s) before transferring the remainder of the sector, thus reducing software overhead, the firm said.

The controller is priced around $5,000. When combined with a typical 40M-byte drive, the system is priced at approximately $11,400.

The firm is at 17131 Daimler St., 92705.

Core Memory Works on DG Units

FORT LAUDERDALE, Fla. – A core memory system, designed especially for use with Data General Corp.'s Series 2/2 and 2/10 minicomputers, has been introduced by Standard Memories, Inc.

The memory is said to be completely pin-compatible with the Nova machines.

Designated as Pincomm Model 16KN16MM, the system contains 16K 16-bit words, and it meets or exceeds all original CPU parameters, the firm said.

The unit offers savings of up to 40% over the CPU manufacturer's core, according to the company at 2801 E. Oakland Park Blvd., 33306.

Mini Provides Management Tools for Bowling Company

ATLANTA – When its 11-year-old bookkeeping machine finally wore out, the management of All American Bowling Corp. (AABC) had two choices. The machine could be replaced and it could go on as before, or it could upgrade its systems with a minicomputer, explained Office Manager Voncile Hall.

AABC took the step of installing an NCR 399 Accounting System.

The company owns eight bowling lanes, and the accounting for each establishment is divided into departmental profit centers: lanes, lounge and restaurant.

Based on daily income and expense reports furnished by the houses, the Atlanta office balances each profit center and the corporate books monthly and prepares detailed profit and loss statements for each house and profit center. There are also detailed and summary reports for corporate management.

In total, about 25 reports are prepared each month.

"Under the manual system, it took three of us about a week to assemble the figures from the ledger cards, add them and balance," said Hall. "After that we began typing the report."

It now takes less than two days to balance, and the reports are printed out automatically, she said. And most of it is done by one person.

The NCR 399 stores data either on the ledger cards or on magnetic tape cassettes. The ledger cards, one for each account number, are separated into three major file segments: payroll, accounts payable and general ledger.

Daily Reports

When the daily income and expense reports are received from the houses, they are checked for accuracy and twice monthly posted to the ledger on the machine. Usually they are entered in sequence, according to account number, directly onto the tape cassette.

On completion of the entries, the program in the machine requests that the ledger cards be inserted in the 399 in order and posting is done automatically from the tape to the ledger card.

To check accuracy, the machine holds the totals until posting is finished and then prints out a report showing balance or imbalance. "If our dailies didn't balance when we posted them on the old machine, we'd never know it," said Sandra Wallace, head bookkeeper.

"It was easy to make an error, But, now, if our debits and credits don't equal, the machine tells us and we can stop right there and catch the error."

Accounts payable cards are posted and checks are machine-written once a week. The accounts are initially posted by entering new invoices on tape. The vendor ledger cards are then inserted in the system and the operator indexes the invoice number or numbers to be paid.

The machine then searches both card and tape for the information, computes the total of the check, types both the check and stub and prints out the detail on both the front of the ledger card and on the magnetic stripe.

The computer also retains the totals and, when 25 checks have been written, it prints out a report grouping all checks by category (i.e., shoe purchases, food, liquor, maintenance, etc.) and by house location. This provides a detailed audit trail in case of questions from a vendor.

Eight tape cassettes – one for each house location – contain complete payroll records for the company's more than 200 employees. Each payroll period, the checks are printed automatically and each employee's ledger card is updated from the tape.

At the same time, a quarter-to-date payroll register is printed out to confirm that the payroll is in balance.

IRS Forms

With the payroll data available on the ledger cards, the computer was programmed to print out the quarterly Internal Revenue Service (IRS) Form 941 for each location, and, at the end of the year, it also will compute and print the employees' W-2 forms.

"When we made up the payroll ledger cards, we indexed the total year-to-date information for each employee on his card," said Wallace. "At year end, it was a simple matter to enter the data into the machine and let it do the rest."

Wallace said in past years one employee was dedicated to the W-2s at year-end. "It took weeks for him to type them all up and then balance them back to the payroll," she said.

Once a month, the machine operator enters all the information from the more than 900 ledger cards onto tape cassettes to run his trial balance and profit and loss statements.

"With the same program and data, we can prepare five different reports," said Hall.

The key monthly report is the detailed statement of profit and loss for each house. The house managers are paid a commission on profits over a base year, so the detail provides them with a management tool.

Comparison is made with last year and base year figures for the period and for year to date. The botton line provides gross and net income, expense and profits.

From the same data, the computer prepares a detailed, consolidated report of all houses and a summary profit and loss of the corporation for the Atlanta corporate management.

The profit and loss statement program was created for AABC by NCR programmers to fit the company's specific needs; however, all other programs the company uses were already available on magnetic tape cassettes in the NCR library. Using available programs not only lowered the startup cost, but it also helped to get the machine on-line more quickly, Hall noted.

Getting Money's Worth

"The 399 costs about twice what the old mechanical machine did in monthly rental," said Hall, "but we're getting our money's worth. To get the information we get in the detail we get it would probably take two more employees. As it is, we're doing the job with the equivalent of one less bookkeeper than we had before."

She considers what is now being done as preliminary. The next step is to acquire a second tape cassette handler and handle accounts receivable and inventory with the minicomputer.

Two One-Day Tutorials Planned For Day Before Compcon 75 Fall

SILVER SPRING, Md. – Two preconference tutorials, "Structured Programming" and "Protection of Information in Computer Systems," are planned for Compcon 75 Fall, a conference sponsored by the IEEE Computer Society.

"Structured Programming" will consist of a series of four lectures given by Dr. Victor Basili of the University of Maryland and Terry Baker of IBM Federal Systems Center, who plan to blend theory and practice.

Dr. David Clark and Dr. David Redell, both of MIT Project MAC, will conduct "Protection of Information in Computer Systems." They plan to cover the basic principles of information protection and various methods available, concluding with a state-of-the-art summary and a discussion of current research directions.

Both tutorials will be full-day sessions held simultaneously on Sept. 8. The conference will be held Sept. 9-11 in Washington, D.C. Tutorial registration is separate from the conference; fees for either, including lunch and text, are $50 for IEEE and Computer Society members and $65 for nonmembers.

For further information, contact Compcon 75 Fall Tutorials, P.O. Box 639, 20901.

Societies/ User Groups

Calendar

June 28-July 1, Boulder, Colo. – Fifth Biennial International Codata Conference, sponsored by the International Council of Scientific Unions Committee on Data for Science and Technology, at the invitation of the National Academy of Sciences. Contact: H. van Olphen, executive secretary, National Research Council, 2101 Constitution Ave., Washington, D.C. 20418.

July 21-23, Boston – Optical Character Recognition Users Association (OCRUA) Conference. Contact T. David McFarland, OCRUA, 505 Busse Highway, Park Ridge, Ill. 60068.

July 21-23, Mobile, Ala. – Visually Impaired Data Processors International (VIDPI) Conference. Contact: VIDPI, P.O. Box 844, Evergreen, Ill. 60642.

July 21-25, Mexico City – Fifth Annual International Computer Exposition for Latin America. Contact: Seymour A. Robbins, National Expositions Co., Inc., 14 West 40 St., N.Y. 10018.

Aug. 12-14, Boulder, Colo. – Third Annual Symposium on the Simulation of Computer Systems. Contact: Mr. John Caron, Fedsim/NA, Washington, D.C. 21330.

Aug. 24-30, Boston – Sixth Triennial World Congress of the International Federation of Automatic Control (IFAC). Contact: IFAC/75 Secretariat, 400 Stanwix St., Pittsburgh, Pa. 15222.

DPMA Head Named

PARK RIDGE, Ill. – The Data Processing Management Association (DPMA) has chosen T. David McFarland, formerly membership director, as acting executive director. He succeeds Donn W. Sanford, who is resigning.

Sanford is leaving to establish an association management service, administering several smaller organizations. He has been DPMA executive director since October 1972 and will continue to serve as a consultant to the association for several weeks.

McFarland joined DPMA as membership director in January 1973. Previously, he had been assistant secretary for membership activities of the American Society of Agricultural Engineers.

While DPMA membership director, McFarland was responsible for all membership activities, strengthening of chapter relations, improving communications between International and the chapters and especially for membership recruitment and retention.

Duo Gets Man-of-the-Year Award

PARK RIDGE, Ill. – The Data Processing Management Association's (DPMA) 1975 Computer Sciences Man-of-the-Year award was presented to both Willis H. Ware, PhD, senior computer scientist at The Rand Corp., and Donald L. Bitzer, PhD, director of Computer-Based Education Research Laboratory at the University of Illinois.

This marks the first time DPMA's Executive Council chose two men for the international award, which is presented in recognition of outstanding contribution to the field of computer sciences.

Ware was recognized for his technical contributions to computer science over the years as well as for his efforts in the area of major national issues, especially as they relate to individual privacy, according to DPMA International President Edward J. Palmer. Ware is the author of 23 articles and papers on computers, computing, data banks, data security and privacy rights.

Bitzer is author or coauthor of 36 articles on computer-related subjects and a holder of a number of patents. He is most noted for the development of Plato, a computer-assisted, instructional timesharing system which includes 400 terminals nationwide.

CDP Review Course Offered by College

WALTHAM, Mass. – A review course for the Certificate in Data Processing (CDP) Examination will be offered by the Bentley College Center for Continuing Education for those planning to take the February 1976 exam.

The course reviews the five relevant topics of the exam: DP equipment, computer programming and software, principles of management, quantitative methods and systems analysis and design.

It will begin Nov. 18 and continue for 10 Tuesday evenings, 6:30 to 9:00 p.m. For further information, contact the Bentley College for Continuing Education, Waltham, Mass. 02154.

COMPUTER INDUSTRY

CI Notes

Memorex, IBM Trial Date Set for September, 1976

LOS ANGELES – The trial date of Memorex Corp.'s antitrust suit against IBM has been tentatively set for September 1976, Judge Ray McNichols indicated in a pretrial hearing here recently.

McNichols tentatively set the date over the objections of the IBM lawyers, who wanted to start one of the smaller "West Coast" actions before the start of the Memorex case.

At the same time, both Transamerica Computer Corp. and Marshall Industries indicated they would be ready for trial at about the same time as the start of the Memorex action, while California Computer Products (Calcomp) and Hudson General Corp. indicated they would be ready to start trial between three- and six months after evidence has been presented in the government's case against IBM.

McNichols said he would set a firm date for the Memorex trial at a pretrial hearing in San Francisco on July 10.

In other action during the pretrial, the judge denied a request by Calcomp to separate the trade-secret phase of its trial from the antitrust case.

Calcomp had wanted a trial on the trade-secret issue before the antitrust trial. IBM charged Calcomp with trade-secret violations as a counter suit to the Calcomp antitrust case against it.

Apparently, the judge was not persuaded there would be any economies in hearing the trade-secret matter first, since many of the same issues will be treated in the antitrust case.

CIA Offers Document Index

ROSSLYN, Va. – The Computer Industry Association (CIA), in cooperation with Ed Burnett of Consultant, Inc. is offering a computerized subject index of all documents filed in the U.S. vs. IBM antitrust trial.

The Alpha-Index is based on public documents filed with the U.S. District Court for the Southern District of New York, and will be keyed to microfiche as well as hard-copy reproductions which may be ordered directly from CIA as desired.

The service is available for a charge of $50 for the initial 175-page index and $40 for each subsequent monthly update from CIA at 1911 N. Ft. Myer Drive, Suite 801, 22209.

National Orders Shugart Floppies

SUNNYVALE, Calif. – Shugart Associates will supply National Semiconductor with its SA900 flexible disk drives for use in National's floppy disk operating system for its IMP-16 microprocessor prototyping system.

The contract is valued in excess of $200,000 to be delivered over the next year.

Sperry, Saab Ink Final Pact

BLUE BELL, Pa. – Final agreement has been signed by Sperry Rand and Saab Scania Aktiebolaget Linkoping for a joint venture firm, Saab-Univac, to market and service DP equipment in Denmark, Finland, Norway and Sweden.

Supershorts

Digital Equipment Corp. has delivered the first prototype of its LSI-11 microcomputer to General Radio Co.

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Courier Terminal Systems, Inc. has received an order for its 15,000th unit.

Independents to Garner Half

3348 Mart Seen Topping 170,000 by '80

By Nancy French
Of the CW Staff

SANTA CLARA, Calif. – U.S. sales of Winchester-type disk modules by both IBM and the independent peripheral manufacturers should reach 170,000 units for total sales of $198 million by 1980, a recent Memorex Corp. forecast said.

According to Steve Stone, product planning manager for Memorex's version of the IBM 3348 pack – the Data Mark 70 and 70F (fixed-head model) – the independents will get nearly half that number, or 80,000 modules by that date.

IBM's sales will peak in 1978 at 90,000 modules when the giant stops manufacturing the Winchester in favor of the Weatherby and the new media being offered with its future systems, Stone said.

Memorex Corp. will begin to ship production models of the Data Mark 70 and 70F on or about July 1, Stone said in a recent interview here.

In announcing this delivery date, Memorex becomes the third independent to ship the totally enclosed Winchester-type module. BASF and 3M Co. are already in production, with Control Data Corp. and Nippon Peripherals of Japan planning to enter the field soon.

Although Memorex will not offer the drive as part of its product line, Control Data Corp. and Nippon Peripherals have announced 3340-compatible drives in addition to the disk module.

Despite the availability of independent drives, Memorex planners expect that more than 75% of the installed spindle base will be IBM-made.

Stone said the company expects that between 1978 and 1980 alone, 25,000 modules will be manufactured by the independents, about 10,000 of which will be sold as IBM replacements, thus increasing the module population by 15,000.

In predicting the data module's rosy sales picture, Stone noted IBM's expansion of the 3340 disk drive to more IBM systems.

IBM recently announced that by May 1976, a new interface will permit its use on the System/7. In December 1974, use of the 3340 was extended to the System/3 Model 15 B and C. In September 1974, the drive was offered for use on the IBM 370/115 and 125.

At present, Memorex counts 30,000 installed 3340 spindles and estimates 80,000 spindles in 1978 and 85,000 spindles by 1980.

A somewhat less optimistic forecast published by International Data Corp. (IDC) estimated that, by midyear 1975, 15,000 IBM 3340 spindles would have been installed and, by mid-1978, that number would grow to 45,000.

IBM's list price for the 3348 is $82/mo under its monthly availability charge plan (MAC). Under a 24-month rental agreement, the user pays $70/mo with an outright purchase set at $2,200.

Memorex will offer its comparable Data Mark for $70/mo based on a three-year lease/purchase plan. Purchase price is $2,000, Stone said.

The fixed-head version will cost $4,000.

Read/write heads, servo head, preamplifier, spindle, carriage and base plate are encased within a heavy-duty plastic cartridge. Since the heads never need be realigned, maintenance costs are greatly reduced in the module, he added.

IBM S/32 May Now Spur Activity By European, Japanese Makers

By Molly Upton
Of the CW Staff

The recent introduction of the IBM System/32 in Europe and Japan has caused mainframers to focus increased attention on the low end of the small systems market.

EDP Japan Report (EDP/JR) viewed the announcement as tossing the Japanese computer industry "into a period of bare fangs competition even before the 100% import liberalization scheduled for December."

The System/32 announcement in Europe was "the biggest threat yet to the indigenous [small business system] market," said *EDP Europa Report* (EDP/ER).

Although it was thought IBM Japan would delay the introduction of the System/32, the competition was heating up in the low end of the small systems market and IBM decided a delay would put it at a disadvantage, according to EDP/JR.

The machines on the Japanese market will be produced in Toronto and are priced between $35,100 to just over $43,000, the newsletter said.

Prices on the system in the UK are about 30% higher than those in the U.S., said EDP/ER.

In Japan, the two primary markets are large users who will use the System/32 as a terminal and small users. Large firms are expected to be the immediate target area.

Industrial Application Programs (IAP) will be available for inventory management, sales statistics and profit planning, production of sales slips and credit management.

IBM Recruiting

Estimates indicate there are 130,000 businesses that can use some sort of computer but are not yet doing so.

To cover this burgeoning market, IBM has reportedly been recruiting sales personnel from other manufacturers to close the sales manpower gap between it and its domestic competitors, which have larger

(Continued on Page 37)

GSA, IBM Talks Deadlocked?

By a CW Staff Writer

WASHINGTON, D.C. – Negotiations between IBM and the General Services Administration (GSA) on their 1976 ADP schedule contract are reported deadlocked over whether IBM will be awarded any contract business beyond continued rental and maintenance of equipment already in place, according to a source within the GSA.

George Dodson, director of GSA's Division for Automated Data Management Services would neither confirm nor deny that information, pointing out the procurement is in negotiation and it would be inappropriate to discuss the matter.

An IBM spokesman offered the same information.

If IBM and GSA do not reach an agreement by June 30, it will be necessary to request a continuing agreement with IBM until such time as a new contract is signed, according to Dodson, who added, "this is nothing new."

Without an ADP schedule for fiscal year 1976, government agencies which rent IBM equipment on a year-to-year basis will have no discounted price list under which to rent that equipment.

They might be forced to deal with IBM on an individual basis and obtain equipment through competitive solicitation.

If GSA officials have their way, the source said, IBM would be given a contract to cover only installed equipment and force the company to bid other new business competitively, a procedure which historically has yielded little government business for IBM.

IBM, apparently, is not interested in a contract that eliminates the usual schedule business, and there the negotiations stand.

The story began when it became known IBM had failed to submit its bid for the ADP schedule contract before the February 28 deadline stipulated by GSA's invitation for proposals [CW, March 26].

At that time, IBM watchers speculated the company was trying to pressure GSA to accept increased prices for installed equipment.

On the face of it, GSA appears to be negotiating with IBM, rather than uphold-

(Continued on Page 39)

Breyer Named IDC President

WALTHAM, Mass. – John P. Bryer has been named president and chief operating officer of International Data Corp. (IDC), a market research, analysis and consulting firm, announced Patrick J. McGovern, IDC's board chairman and chief executive officer.

Prior to his appointment, Breyer was executive vice-president of IDC. McGovern previously served as both president and board chairman of the company.

In making the announcement, McGovern said, "During the past two years, Breyer has assisted me in top management activities, and during that time has been responsible for the development of the company's operating plans, managing their implementation and directing the day-by-day affairs of the business.

"His effectiveness in this post has been fully confirmed by the excellent results achieved by IDC during that period. Therefore, I am pleased Breyer has been elected to the post of president to formalize the description of the responsibilities he has conducted during the past two years."

Breyer first joined IDC in 1967 as director of research, became vice-president/research in 1969, and in 1971 was made executive vice-president.

Before joining IDC, he was a key member of Honeywell's market planning staff,

(Continued on Page 39)

John P. Breyer

Cohabitation With IBM

Xerox Group Reports Good Year

By Nancy French
Of the CW Staff

EL SEGUNDO, Calif. – Xerox Corp.'s Data Systems Division has "had a very good year this year. Some stretching out of orders was noticed earlier, but now we're on target and meeting our goals," said Bob Adams, vice-president, marketing and business development.

The results affirm Xerox's tactic of installing systems to be coresident with IBM units rather than pursuing IBM replacements.

The education market, with its reduced budgets, is responding strongly to Xerox's approach, according to Mike Harvey, manager, systems marketing.

"We have twice the number of qualified prospects now as we had at this time last year, and, in addition, we have booked 70% more orders with the same number of salesmen," he said.

Reports to management indicate OEM sales have picked up about 50% this year, according to Jack King, manager, software and applications services.

"Basically, our sales are a mix of old customers who are now converting to the 550 system and also some new customers we've picked up," he said.

"We measure our productivity on the basis of yield," Harvey explained. "How many users you can convert from prospects to hits, or orders," he said.

"This 'win ratio' has been rising in all market areas an average of 5% to 10% per year," Harvey said. "Either our salesmen are getting smarter, or our customers are getting smarter," he remarked.

The Control Program Five (CP-V), which allows the Sigma 9 or 560 system user to program in five modes simultaneously, makes these ideal systems to add to an existing IBM installation rather than taking the more typical IBM upward-migration path, Adams said.

In addition, modular architecture allows the user to upgrade in increments he can afford, rather than replacing an entire system, he said.

Cohabitation With IBM

Cohabitation with IBM requires that Xerox continue to "lead the way in real-time data processing developed through scientific applications to a point where a company can run its entire business from communication to payroll to general ledger accounting with the same system," Adams said.

Another requirement of IBM cohabitation is "giving the DP user capabilities that don't require him to be an expert in the art of computers," he said.

"We want to give them software for terminals, communications and processing equipment that works easily and put it together in such a way that, if something fails, the whole thing doesn't fall apart," Adams said.

Xerox computer products line is the "strongest it has ever been vis a vis the competition," Adams said. "We've really gotten it together."

The intelligent display system and the 3010 communications terminal introduced at the National Computer Conference recently are expected to give users a complete product line.

CW Photo by N. French
Bob Adams

"The marriage between our hardware with its unique systems architecture and the CP-V operating system is the finest marriage we've seen in a long time," Harvey said.

The energy crisis has helped bring in a lot of new customers, according to King, because people are simulating more rather than doing the actual thing, such as flying a plane for flight training, for example.

Another healthy sales area is fossil fuel power plants, Harvey said. "We have more and more orders from fossil fuel plants that need monitoring and process control," he explained. The new nuclear plants are not being built as quickly as anticipated, he said, and it appears fossil fuel power plants will be around for quite a few more years.

Universities and colleges with enrollment of 2,000 or more students are Xerox Data Systems prime market, however.

Kindergarten to junior college – a school district with 200,000 students – is another typical Xerox customer.

"We sell the multiuse concept – the joint computer center," Harvey explained. "Many small colleges are getting a system for themselves and servicing area public schools with their extra capacity," he pointed out.

Contracts

Leasco Data Selects Decwriter for Line

MARLBOROUGH, Mass. – Leasco Data Communications Corp. has signed an order valued at over $1 million for Digital Equipment Corp. (DEC) LA36 Decwriter II terminals with options. The order is the second largest for computer terminals in DEC's history.

Leasco will market the LA36s under the name Model 30 (L-30) data terminal and will lease the terminals to customers as remote terminals, computer input/output devices or keyboard printers.

"The LA36's speed and flexibility combine to give the user a versatile machine that is price competitive," said Carl English, Leasco's executive vice-president. "Our $85/mo lease rates will include nationwide maintenance support via our on-line automated terminal diagnostic service and a data retrieval system which provides customers with maintenance status reports."

Other Contracts

Acts Computing Corp. has received a total facilities management contract renewal, valued at $1.75 million, from the Nasa Institute for Advanced Computation.

Computervision Corp. has received a $1.3 million contract from the U.S. Department of Agriculture for an interactive graphics system for automated production of soil maps.

Varian Data Machines has received a $2 million contract from the Western Development Laboratories Division of Philco-Ford Corp. for V73 computers and peripherals which will be used by the U.S. Air Force.

Data Printer Corp. has received a long-term OEM contract from Harris Corp. to supply Chain-train series line printers for use in Harris' Cope 1600 remote batch terminals.

Symbiotics International, Inc. has been awarded a contract by International Systems and Controls, Inc. to install and operate a complete DP facility.

Pertec Corp. has received a contract for additional computer output microfilm recorders from Bell & Howell.

Vermont Research Corp. has received a contract from GTE Information Systems, Inc. to supply Model 3016S drum memories over the next 21 months.

NCR Cutting Work Force

DAYTON, Ohio – NCR is continuing to cut back its work force involved with assembly of electromechanical units. At Dundee, Scotland, the firm plans to lay off about 800 workers and to trim its work force at other European locations.

An NCR spokesman said the current economic climate has resulted in reduced customer demand for electromechanical devices and an increased call for electronic equipment.

NCR is expediting its planned conversion in Dundee to the manufacture of electronic equipment.

In Dayton, where the firm's last U.S. plant manufacturing electromechanical devices is located, NCR has offered an early retirement plan to about 1,000 eligible employees in an effort to avoid layoffs of others, a spokesman said.

The union contract expired last March and NCR has proposed a lower wage structure on electronic products in line with those at other plants. Terms are being negotiated.

Manufacturing employment at Dayton will be cut to about 1,900 by the end of next year compared with about 3,000 now, the spokesman said.

Lessor Sues Ampex for Breach of Contract

NEW YORK – North American Corp., a leasing firm, has filed a $35 million breach of contract suit here against Ampex Corp.

In a separate action, Ampex filed a suit in Los Angeles seeking $223,500 it says is owed by North American.

In its suit, North American alleged Ampex has not carried out the terms of a joint venture agreement regarding service and has taken advantage of corporate opportunities, according to North American attorney John Hale of Hale & Russell here.

North American said Ampex employees, when servicing North American's accounts, have induced users to cancel their North American agreements and procure new equipment from Ampex.

North American also has asked for an injunction requiring Ampex to carry out its obligation as servicing agent.

An Ampex spokesman said company attorneys are still reading the suit and have no comment as yet. The firm plans to file a countersuit, he added.

The agreement between the two firms was signed in 1972 for the life of the equipment, with Ampex providing service, Hale said. North American bought the base from Ampex and owns the equipment and the leases.

The equipment, valued at $31 million in original cost, consists principally of tape drives and memories.

Xerox Faces Suit Brought by IVC

SAN JOSE, Calif. – International Video Corp. (IVC) has filed a suit against Xerox Corp. charging breach of contract, fraud and negligent misrepresentation and seeking $12 million.

IVC is seeking $2 million in compensatory damages and $10 million in punitive and exemplary damages in its suit, filed in the Superior Court of Santa Clara County.

A Xerox spokesman said the firm's lawyers are studying the suit and there is no comment at this time.

The action arose out of a service contract with Xerox that began in the fall of 1973.

Under the agreement, Xerox was to provide an integrated DP system with accounting and financial systems.

IVC alleged Xerox not only breached the contract, but intentionally and negligently misrepresented the capacity of its DP system and the nature and extent of services it could and would provide.

Xerox failed to return to IVC in usable form its business data, IVC charged, which caused it to employ another service bureau to reconstruct the data.

S/32 Seen Spurring Overseas Activity

(Continued from Page 35)

sales forces and extensively employ sales agents.

IBM Japan has also instituted a direct mail campaign, but its executive vice-president denied any intent to use sales agents for at least the next five years.

"We have no plan to use sales agents at least in the next five years. We believe the best customer service is only available through first-hand service," Mitsuhiko Hamaguchi said.

Not Standing Idle

The Japanese makers of small business machines have not been standing idle watching IBM penetrate into what is a new market for it.

Instead, NEC has launched a sales campaign for the NEAC System 100 with the slogan, "Let's penetrate into every nook and corner of the country with our NEAC System 100," EDP/JR said.

All 32,000 employees were expected to submit names of prospects.

About 1,200 orders for the NEAC System 100 were booked between its introduction in August 1973 and March 1975. The firm expects another 1,000 orders this fiscal year, EDP/JR said.

Fujitsu is planning to launch two small systems, the Facom VI and Vo-1, in August. The VI will compete directly with the System/32, the report said.

Fujitsu said it received about 500 orders for its previously announced Facom Vo office computer between August 1974 and March 1975.

Toshiba also has two small business systems it plans to introduce, one of which will compete directly with the System/32 with a monthly rental of about $667, the newsletter said.

Negotiations are proceeding between Toshiba and NEC regarding joint development plans for the Acos series of computers, EDP/JR said.

Immediately after the announcement of the System/32 in Japan, both Hitachi and Mitsubishi Electric announced small business machines.

Hitachi unveiled the Hitac 85 developed by Singer and produced by Hitachi, which sells for between $26,667 and $46,667 with 12K to 44K bytes of memory.

Mitsubishi has begun marketing the Melcom 80 Model 11. Mitsubishi has already installed 4,700 units of its Melcom 80 series, 400 of which are in Europe.

Foreigners Active

Other foreign manufacturers, such as Data General, Burroughs and Olivetti, have been actively marketing new introductions in Japan, and Digital Equipment Corp. is expected to launch its 310 sometime this year, EDP/JR said.

The System/32 is offered in the UK with only two of the IAP packages – for construction and wholesale food industries.

IBM is making presentations to over 100 software houses, which EDP/ER sees as an important part of IBM's marketing strategy.

IBM's introduction of the System/32, with no pretense of its being an "entry-level machine" with future upgrades in mind, "is a direct assault on the market pioneered by the systems house users of minicomputers and the other independents and is using the same outlets," the newsletter said.

Expects 25% Growth Rate

Vector General Cuts Projections

CW Photo by N. French
Prentiss Uchida

By Nancy French
Of the CW Staff

WOODLAND HILLS, Calif. – Vector General, Inc., a manufacturer of interactive refresh graphics systems, has cut its 1975 growth projections from a previously forecast 60% to a more realistic 25%, according to Prentiss Uchida, president of the firm.

"By most standards, 25% is still a decent growth rate," Jack Nicholson, vice-president of marketing, said.

Despite this year's reduced growth aspirations, the company has more than 225 installations to date, leading each of its principal competitors by two to one, Uchida said.

Another point in the company's favor is its "good cash position," Nicholson said. "When the economy started weakening late last year, we went into a cash management mode.

"We got our receivables in good shape so that we have all our accounts under 60 days," he said.

"Now, when others are cutting corners, we have the advantage of being able to step forward to provide the extra services that will help build the company's reputation over the short as well as the long run," Nicholson said.

Vertically Untapped

While a wide range of applications has already been developed for the Vector General Equipment, Uchida sees many vertical industries as a great untapped market.

Architecture, for example, could greatly benefit by interactive graphics technology, he said, but architecture firms are rarely large enough to purchase such high-cost equipment.

In addition, "there is a gap between this profession and the computer industry that must be filled by someone with expertise in both fields" – a vertical service bureau, for example.

Without the right people to fill the gap, prices will have to be reduced quite drastically before such vertical areas will be able to utilize the convenience and time-saving benefits that graphics terminals could bring them, Uchida said.

Nicholson sees flight simulation and war gaming as "explosive growth areas," especially now that fuel availability is becoming a problem.

Uchida said Vector General has no immediate plans to introduce any new products. "Why should we compete with our existing product line?" Nicholson asked.

The Vector General product line consists of two product families, the Series 3 high-speed peripheral graphics terminals and the Vectorgraphics 11 interactive graphics system.

A major selling point for the firm is that software has been designed to allow the high-speed graphics terminal to function with about 15 different 16-bit minicomputers.

The Series 3 terminal as well as the Vectorgraphics 11 system are employed in "tasks that range from pattern layout in the garment industry to flight simulation in the aircraft industry to cell simulation in cancer research," Nicholson said.

"The product line fits into a price niche between $10,000 and $150,000," according to Uchida, and produced revenues for fiscal 1974 in excess of $4 million.

At the present time, Vector General sells through OEM manufacturers in the U.S. and a network of distributors in Europe, Japan, Israel, Australia and Canada.

The company, which has grown from a team of 20 in 1969 to about 100 employees today following a 10% layoff late last year, still maintains the personality of a very small firm.

Reflecting on the growth of the company since its start up in 1969, Uchida remarked that he is proudest of its acquisition of good people to perform functions for which the original team had no talent.

"There is no way a single person can do a job as well as a group," he said. "We have had to grow out of our one-man-band mentality and turn over responsibilities to others."

School Gets Air Force Debugging Grant

BROOKLYN, N.Y. – The Polytechnic Institute of New York has received a $408,000 grant to predict software errors and to develop techniques to prevent and eliminate mistakes made in Air Force data processing.

Under the three-year grant from the Rome Air Development Center, the project team headed by Martin L. Shooman will seek to develop the fundamental methodology and measurements to put a numerical qualifier on the error content in software contracts, Shooman explained.

"The Air Force spends between 25% and 50% of its software development time and millions of dollars annually on correcting programming errors in its computer systems," he said.

"Experience has shown us that, whenever we are able to qualify reliability, acceptably low failure rates can be designed into a system and maintained by careful management to produce good operational equipment," Shooman said.

In addition, researchers will study theoretical and practical techniques to test programs and determine the best ways to write reliable programs using different systems, programming teams and programming languages.

Group/3 Plan Offers Up to 20% Reduction

LOS ANGELES – Customers who make a commitment to a minimum dollar amount on any combination of Group/3 products for small business computers over a three- to 12-month period will receive as much as a 20% price reduction, according to William Leeds, general manager of Informatics, Inc.'s Group/3 Division.

The plan, called the Annualized Buying Commitment Program, is one of a number of plans instituted by Informatics since it took over Group/3.

Expansions

Telos Computing, Inc. has leased 3,300 sq ft of office building space in Santa Monica, Calif.

Technicon Medical Information Systems Corp. has opened a multimillion center for Eastern Operations in Fairfield, N.J., which houses computers and personnel to service client hospitals on the East Coast.

Burroughs Corp. has leased 8,000 sq ft of industrial space in Irvine, Calif.

Sycor International Ltd., a wholly owned subsidiary of Sycor, Inc., has established a manufacturing operation in Toronto, Ont.

Computerized Automotive Reporting Service, Inc. and its sister companies, **Business Communications Sciences** and **Action Computer Technology**, opened their international headquarters and computer center at 210 Automation Way, Irondale, near Birmingham, Ala.

Services Industry Beginning to Show Its Strength

By Bill Whalen
Special to Computerworld

The computer services industry is booming and should outgrow its "nondoting parent" – computer hardware – in 1975.

Computer services and net worldwide, general-purpose computer hardware shipments are expected to tie at about $7 billion in 1975 revenues.

The services industry has been showing about 50% stronger growth than hardware sales. The industry is youthful, lean – it shed a lot of baby fat in '69 and '70 and is learning well about the economies of scale.

There are no behemoths feeding upon the smaller competition – the gitans of this industry still generate less than $200 million in sales.

Computer services should fare especially well in this tightening economy as users' "capital spending" budgets generally have been slashed. But the services vendors, by placing increasingly greater emphasis on analytical and other decision-making/money-saving tools, continue to win a larger share of clients' operating budgets.

A quick look at the 1975 Adapso forecast for the computer services industry breaks that $7 billion down, with support services, including education, third-party leasing and maintenance and used computers garnering 30%, followed by facilities management with 21%.

Network information services should edge ahead of batch service bureaus with 16.6% and 16.2% respectively, followed by software products, 9% and software services, 7.9%.

The data processing services segment, which excludes support services, will generate about $5 billion of revenues this year, which is more than the anticipated 1975 net growth in U.S. hardware shipments.

There are about 1,700 U.S. vendors of computer services ranging from simple, source data conversion to total facilities management.

All of them, unlike in-house DP facilities, function as profit centers – a business in itself – and one that continually learns from and resells its experience.

The typical in-house system staff, in contrast, is constantly pioneering – trudging uphill, all the way. How many payroll, inventory, financial reporting systems or even networks, does one organization need?

Beat of a Different Drummer

The pressures today on top management are not merely to cut DP costs, but to minimize overall costs.

The days of the chrome-plated, showcase-window computer and the grandiloquent management information system dream schemes are gone. Users have matured and are thoughtful, cost conscious and results-oriented.

Using outside services can offer several advantages.

A user pays for 100% of that in-house hardware configuration, but rarely ever uses 100% of what he has – even 50% of the time.

Services offer "variable processing power" and cost and without constant reconfiguring or major commitments.

It has been estimated that one out of five companies now uses a services organization exclusively for processing its data.

Another survey showed that well over half of the computer services industry revenue comes from large clients with sizable in-house installations.

New users are contracting for outside services at record rates in searching for cost-effective results.

Whalen is an industry observer.

GSA, IBM Talks Rumored at Halt

(Continued from Page 35)

ing the deadline called for in its request for proposals.

However, GSA's position on the matter, according to Dodson, is that the GSA has never confirmed IBM's bid was late.

GSA Under Criticism

GSA has been under continuing criticism for failing to police agencies in their dealings with IBM. IBM has been criticized for acepting orders in excess of the ADP schedule's maximum order limit.

For example, IBM accepted the U.S. Army's order for the $28 million Alpha system which was in excess of the maximum-order limit at schedule prices through an existing open-ended contract.

In that case, critics said, the contract should have been competitively bid, thus saving up to 40% on the contract rather than the 8% discount received on schedule prices.

Congressman Jack Brooks (D-Texas) has requested the U.S. government's Renegotiation Board, which reexamines government contracts negotiated in haste, to inquire into IBM's sale of old 360 equipment as new, in violation of the ADP schedule contract.

Some third-party lessors had been excluded from bidding the ADP schedule because they offered only used equipment.

Finally, the most recent Government Accounting Office decision on a protest filed by Comdisco, a third-party lessor, stated agencies should be required to advertise ADP requirements in the *Commerce Business Daily* before placing orders against the IBM schedule, thus giving other IBM equipment owners an opportunity to bid.

Leasing firms are anxious to have the IBM–GSA negotiations settled so they can determine their own pricing strategies, according to Charles Barry, Comdisco's manager of government sales.

Breyer Elected President of IDC

(Continued from Page 35)

where he specialized in the development of industry-oriented market plans.

Prior to that, he was in the product planning area of Honeywell EDP, where he was instrumental in the development of the Series 200 line.

Breyer is a graduate of the Technical University of Budapest, Hungary, where he majored in electronic engineering. In addition, he holds a liberal arts degree from Yale, and has taken courses in the computer sciences at the Massachusetts Institute of Technology and the University of Pennsylvania.

Breyer resides in Weston, Mass. with his wife and their two children.

Executive Corner

■ Stephen R. Levy has been elected executive vice-president and Raymond S. Nickerson has been elected a vice-president of Bolt Beranek and Newman, Inc.

■ William R. Smart was named senior vice-president of Honeywell Information Systems and Allan L. Rudell vice-president of investor relations of Honeywell.

■ Lorne K. Lodge has been elected to the board of directors of IBM World Trade Americas/Far East Corp.

■ Roger W. Goetz, former vice-president of Computer Investors Group, Inc., has been appointed vice-president of marketing of Telenet Communications Corp.

■ Bowen Roberts has been named vice-president of marketing of the southern region for National Data Corp.

■ Carl English has been appointed executive vice-president of Leasco Data Communications Corp.

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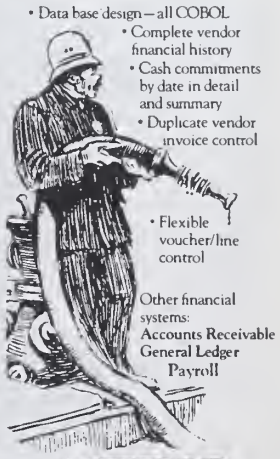

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But On-Line Foresees Downturn

Keydata Third-Quarter Results Strong

Keydata Corp.'s strong third-quarter results provided more than half the net for the firm's nine-month report as earnings grew progressively in each of the three quarters this year.

But at On-Line Systems, another time-sharing firm, problems within the firm's Government Division caused a downturn in quarterly earnings although earnings remained increased during the nine-month period.

The firm anticipates decreased earnings for the next two quarters and expects revenues and earnings to recover after the second quarter of next year.

A turnaround within the firm's Government Division is expected to require about two quarters before becoming apparent, a spokesman said.

Energy Revenues Drop

In addition, the firm expects to lose business from the Federal Energy Agency over the next two quarters.

"As a result, revenues from the Federal Government may decline by as much as $400,000 during the fourth quarter of this year and by as much as an additional $250,000 during the first quarter of fiscal 1976," according to Jack Roseman, president and John T. Godfrey, chairman of On-Line Systems.

"Expense levels are planned to remain at or near present levels in anticipation of continued growth from existing and new accounts, and lower per-share earnings for the next two quarters are expected to result," they said.

Revenues generated from new commercial accounts during the third quarter improved greatly, they noted.

Quarter Net Declines

For the quarter ended Jan. 31, On-Line Systems' earnings dropped to $289,006 or 35 cents a share compared with $409,292 or 46 cents a share in the year-ago period.

Revenues rose 16% to $2.9 million compared with $2.5 million in the same 1974 period.

During the nine months, earnings rose to $1.2 million or $1.40 a share compared with $1.1 million or $1.26 a share in the year-ago period.

Nine-month revenues at On-Line jumped 32% to $9 million compared with $6.9 million in the same 1974 period.

Keydata Restated

At Keydata, third-quarter earnings rose to $155,000 or 6 cents a share, including a $74,000 tax credit, compared with a restated $147,000 or 5 cents a share in the same period last year when the tax credit was $68,000.

Revenues grew to $3.4 million compared with $3 million in the 1974 quarter.

The 1974 figures have been restated downward to reflect a change in accounting to expense marketing and product development costs as incurred.

The change reduced nine-month earnings in 1974 by $95,000 and the three-month figure by $31,000, the firm said.

For the nine months, earnings at Keydata totaled $291,000 or 11 cents a share compared with $510,000 or 18 cents a share in the year-ago period.

There was a $135,000 tax credit in 1975 compared with $239,000 in the year-ago period.

Revenues grew to $9.8 million compared with $8.8 million in the 1974 nine-month period.

Two OCR Makers Report Sharply Different Nets

Recognition Equipment, Inc.'s (REI) results were up sharply during the six months ended April 30, but Optical Scanning Corp. showed losses in the nine months and quarter ended March 31.

REI's six-month earnings soared to $1.3 million or 24 cents a share compared with a loss of $721,000 or 14 cents a share in the same 1974 period.

The OCR maker's revenues for the period totaled $29 million, up from $19.1 million in the same period last year.

Of these amounts, revenues from noncancelable long-term leases treated as sales grew to about $3.3 million compared with $1.2 million for the year-ago (six months).

During the quarter, REI earned $694,000 or 12 cents a share compared with $526,000 or 11 cents a share in the same 1974 quarter.

REI gained about $325,000 from translation of foreign currencies in the 1975 period and lost $415,000 in the 1974 six months.

Losses resulting from operation of Corporation S Optimation Centers were $250,000 in 1975 compared with $412,000 last year.

Second-quarter revenues were increased by $6.9 million representing the inclusion of the total value of the First National City Bank's initial Trace system. There was essentially no profit impact from these revenues, the firm said.

The firm backlog as of April 30, excluding development contracts, for both lease and purchase of equipment was $38.5 million in purchase value, up from $22.8 million a year ago.

The $38.5 million includes $492,000 worth of OCR wands scheduled for delivery during fiscal 1975, the firm said.

REI cautioned against forecasting future results based on interim figures because of the large size and uncertain timing of its transactions.

Optical Scanning Dips

Optical Scanning lost $460,037 or 70 cents a share compared with earnings of $574,245 or 87 cents a share, including extraordinary credits totaling $439,894, for the nine months.

The credits included a $211,278 tax credit and a $228,616 gain from the sale of land.

Revenue for this OCR maker's nine-month period dipped to $12.4 million from $14.2 million in the year-ago period.

A change in depreciation policy reduced the nine-month loss by about $28,000 or 4 cents a share, the firm said.

The story was similar for the quarter, with a loss of $291,372 or 44 cents a share compared with earnings of $424,098 or 64 cents a share last year, including $373,294 in special credits.

Correction

Bolt Beranek and Newman earned $1.1 million during the nine months ended March 31 despite a $274,900 loss from development and startup costs of Telenet Communications [CW, May 28].

Earnings Reports

APPLIED DATA RESEARCH
Three Months Ended March 31

	1975	a1974
Shr Ernd	$.02	.....
Revenue	3,175,900	$2,148,381
Disc Op	(87,397)	.....
Tax Cred	11,000	.....
Earnings	23,325	(422,625)

a-Restated.

COMPUTER INSTRUMENTS
Three Months Ended April 25

	1975	1974
Revenue	$1,458,934	$1,539,837
Loss	138,700	127,866

DIGITAL COMPUTER CONTROLS
Year Ended Feb. 28

	1975	1974
Shr Ernd	$.15	$.07
Revenue	9,756,140	6,251,983
Tax Cred	.....	66,000
Earnings	230,697	110,129

TELEX
Year Ended March 31

	1975	1974
Shr Ernd	$.13	.....
Revenue	106,016,000	$89,743,000
Earnings	1,397,000	(23,332,000)

DATAPOINT
Three Months Ended April 30

	1975	1974
Shr Ernd	$.50	$.46
Revenue	12,287,000	10,306,000
Tax Cred	336,000	336,000
Earnings	1,097,000	937,000
9 Mo Shr	1.48	1.23
Revenue	33,200,000	24,960,000
Tax Cred	975,000	825,000
Earnings	3,090,000	2,462,000

KEYDATA
Three Months Ended April 30

	1975	a1974
Shr Ernd	$.06	$.05
Revenue	3,392,000	3,013,000
Tax Cred	74,000	68,000
Earnings	155,000	147,000
9 Mo Shr	.11	.18
Revenue	9,804,000	8,789,000
Tax Cred	135,000	239,000
Earnings	291,000	510,000

a-Restated.

WALLACE BUSINESS FORMS
Three Months Ended April 30

	1975	a1974
Shr Ernd	$.55	$.49
Revenue	16,594,000	14,178,000
Earnings	1,051,000	897,000
9 Mo Shr	1.75	1.32
Revenue	50,743,000	39,323,000
Earnings	3,286,000	2,398,000

a-Restated to reflect change to Lifo accounting method.

DELOS INTERNATIONAL GROUP
Three Months Ended March 31

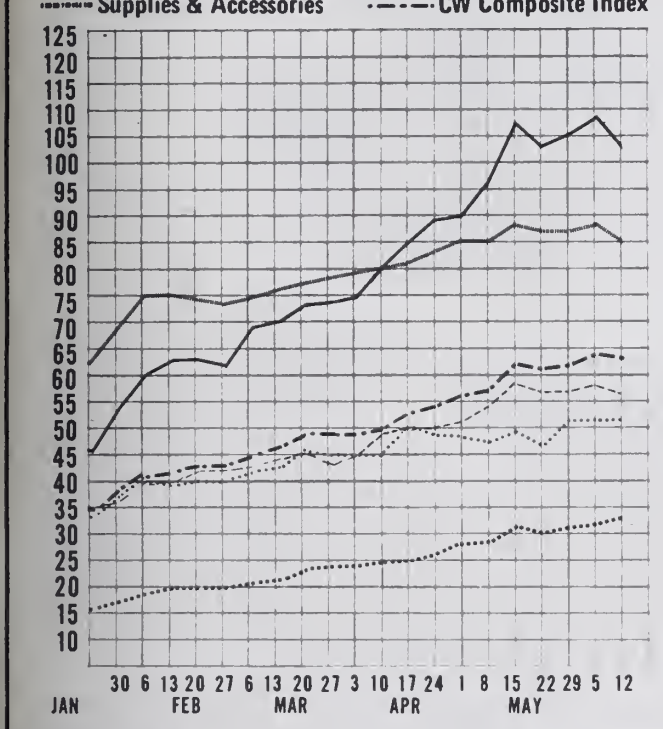
	1975	1974
Shr Ernd	$.12	$.18
Revenue	1,324,705	1,017,348
Tax Cred	72,000	99,000
Earnings	155,514	239,979
9 Mo Shr	.21	.53
Revenue	3,446,649	2,885,850
Tax Cred	94,000	281,000
Earnings	276,359	716,802

VARIAN ASSOCIATES
Three Months Ended March 28

	1975	a1974
Shr Ernd	$.28	$.27
Revenue	76,893,000	70,010,000
Earnings	1,917,000	1,837,000
6 Mo Shr	.49	.48
Revenue	149,582,000	137,403,000
Earnings	3,379,000	3,222,000

a-Restated to reflect change to Lifo inventory valuation method.

COMPUTERWORLD Computer Stocks Trading Indexes



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Northern Regional Manager
Robert Ziegel
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COMPUTERWORLD
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Phone: (617) 965-5800
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Eastern Regional Manager
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TRADE*QUOTES

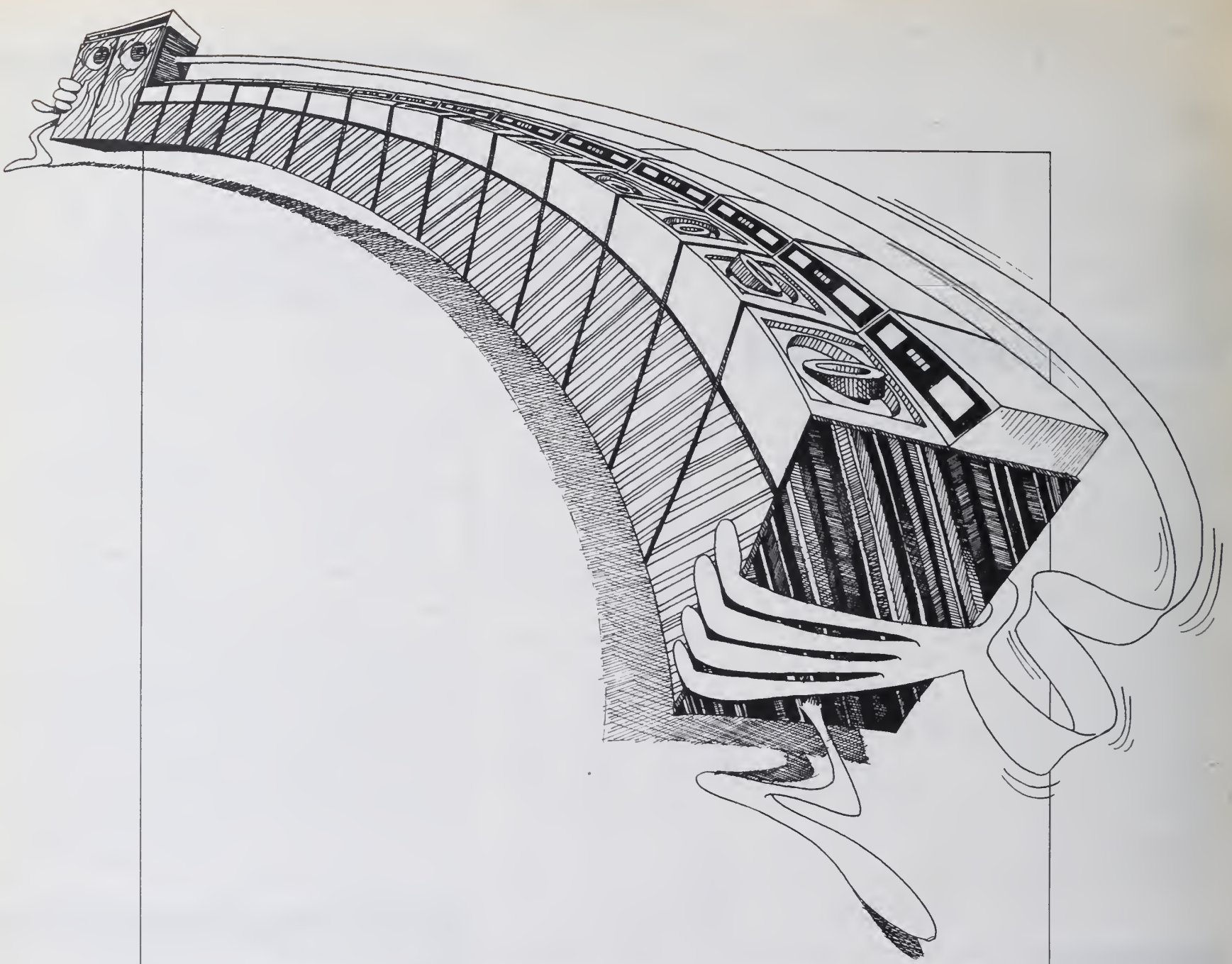
Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, JUNE 11, 1975

All statistics compiled, computed and formatted by TRADE★QUOTES, INC. Cambridge, Mass. 02139

EXCH		1975 RANGE (1)	CLOSE JUN 11 1975	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS				
N	BURROUGHS CORP	62-108	99 1/8	-4 1/2	-4.3
O	COMPUTER AUTOMATION	2- 8	6 3/4	+ 1/8	+1.8
N	CONTROL DATA CORP	11- 23	20 1/2	-1 1/2	-6.8
N	DATA GENERAL CORP	10- 33	28	-4 1/8	-12.8
O	DATAPOINT CORP	6- 25	19 1/2	-4 1/4	-17.8
O	DIGITAL COMP CONTROL	1- 4	3 3/4	0	0.0
N	DIGITAL EQUIPMENT	46-111	99 7/8	-7 1/2	-6.9
N	ELECTRONIC ASSOC.	2- 3	3	- 1/8	-4.0
A	ELECTRONIC ENGINEER.	5- 10	9 1/8	+ 1/4	+2.8
N	FOXBORO	23- 37	35 3/8	-1 1/4	-3.4
O	GENERAL AUTOMATION	6- 11	7 3/4	- 3/4	-8.8
O	GRI COMPUTER CORP	1- 1	5/8	0	0.0
N	HEWLETT-PACKARD CO	58-117	110 5/8	-3 1/2	-3.0
N	HONEYWELL INC	22- 40	36 7/8	-3	-7.5
N	IBM	158-224	210 1/4	-6 3/8	-2.9
O	MEMOREX	1- 10	7 5/8	-1	-11.5
O	MICRODATA CORP	2- 4	3 1/8	- 1/4	-7.4
O	MODULAR COMPUTER SYS	5- 18	13 3/4	-1 1/2	-9.8
N	NCR	15- 39	37 1/4	-1	-2.6
N	PERKIN-ELMER	16- 29	25	-1 5/8	-6.1
N	RAYTHEON CO	26- 55	54 3/4	+ 3/4	+1.3
N	SINGER COMPANY	10- 17	15 3/4	- 3/4	-4.5
N	SPERRY RAND	26- 47	44 5/8	-1 1/2	-3.2
A	SYSTEMS ENG. LABS	1- 4	3 1/8	- 3/8	-10.7
O	ULTIMACC SYSTEMS INC	1- 6	6	- 1/4	-4.0
N	VARIAN ASSOCIATES	7- 12	11	-1 1/4	-10.2
N	WANG LABS.	7- 15	14	- 1/2	-3.4
N	XEROX CORP	51- 86	69 1/2	-3 1/4	-4.4
	LEASING COMPANIES				
O	COMDISCO INC	1- 5	4	+ 1/8	+3.2
A	COMMERCE GROUP CORP	2- 4	2 3/4	- 1/8	-4.3
A	COMPUTER INVSTRS GRP	1- 2	7/8	0	0.0
M	DATRONIC RENTAL	1- 1	3/8	- 1/8	-25.0
A	OCL INC	1- 1	5/8	0	0.0
N	DPF INC	3- 5	5 3/8	+ 1/2	+10.2
O	EDP RESOURCES	2- 2	2	0	0.0
A	GRANITE MGT	1- 5	4 1/2	+ 3/8	+9.0
A	GREYHOUND COMPUTER	2- 3	3 1/8	0	0.0
A	ITEL	3- 8	6 3/4	- 1/2	-6.8
N	LEASCO CORP	4- 8	5 1/2	0	0.0
O	LEASPAC CORP	1- 1	1/4	- 1/8	-33.3
O	LECTRO MGT INC	1- 1	1/8	0	0.0
O	NRG INC	1- 3	2 7/8	+ 7/8	+43.7
A	PIONEER TEX CORP	2- 5	4 1/4	- 1/8	-2.8
A	ROCKWOOD COMPUTER	1- 1	5/8	0	0.0
N	U.S. LEASING	9- 14	10 1/4	+ 1/8	+1.2
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 1	1	0	0.0
A	APPLIED DATA RES.	1- 10	2 1/2	- 1/8	-4.7
N	AUTOMATIC DATA PROC	29- 62	57 5/8	-2 7/8	-4.7
O	BRANDON APPLIED SYST	1- 1	1/8	0	0.0
O	CENTRAL DATA SYSTEMS	3- 3	3 1/4	0	0.0
O	COMPUTER DIMENSIONS	2- 6	5 5/8	- 1/8	-2.1
O	COMP ELECTION SYSTMS	3- 6	5 1/2	+ 1/8	+2.3
O	COMPUTER HORIZONS	1- 1	3/4	- 3/8	-33.3
O	COMPUTER NETWORK	1- 2	2	- 1/8	-5.8
N	COMPUTER SCIENCES	2- 6	6	+ 1/8	+2.1
O	COMPUTER TASK GROUP	1- 1	3/4	0	0.0
O	COMPUTER USAGE	2- 4	2 1/2	0	0.0
O	COMSHARE	3- 4	3 1/2	- 1/8	-3.4
O	DATATAB	1- 1	1 1/8	0	0.0
A	ELECT COMP PROG	1- 1	1/4	0	0.0
N	ELECTRONIC DATA SYS.	12- 28	19 1/2	-2 1/2	-11.3
O	INFONATIONAL INC	1- 1	1/8	0	0.0
O	IPS COMPUTER MARKET.	1- 1	3/4	0	0.0
O	KEANE ASSOCIATES	2- 3	2	0	0.0
O	KEYDATA CORP	2- 3	2 3/4	0	0.0
O	LOGICON	3- 5	4	- 1/2	-11.1
A	MANAGEMENT DATA	1- 3	2 3/8	+ 1/8	+5.5
O	NATIONAL CSS INC	6- 14	11	-2	-15.3
O	NATIONAL COMPUTER CO	1- 1	1/8	0	0.0
A	ON LINE SYSTEMS INC	8- 14	13 7/8	0	0.0
N	PLANNING RESEARCH	2- 5	4 3/4	+ 3/8	+8.5
O	PROGRAMMING & SYS	1- 1	3/4	0	0.0
O	RAPIDATA INC	2- 4	3 1/4	- 3/8	-10.3
O	SCIENTIFIC COMPUTERS	1- 1	1	0	0.0
O	SIMPLICITY COMPUTER	1- 1	1/4	0	0.0
O	TYMSHARE INC	7- 20	17 1/4	-1 3/8	-7.3
A	URS SYSTEMS	2- 3	2 3/4	+ 1/4	+10.0
N	WYLY CORP	2- 4	3	0	0.0
	PERIPHERALS & SUBSYSTEMS				
N	ADDRESSOGRAPH-MULT	4- 9	8	- 1/2	-5.8
O	ADVANCED MEMORY SYS	1- 5	5 1/4	+1 1/8	+27.2
N	AMPEX CORP	3- 7	6 1/8	- 5/8	-9.2
O	ANDERSON JACOBSON	1- 3	2 1/2	- 1/8	-4.7
O	BEEHIVE MEDICAL ELEC	1- 5	4 1/2	+ 1/8	+2.8
A	BOLT,BERANEK & NEW	5- 9	7 3/8	- 1/4	-3.2
N	BUNKER-RAMO	4- 7	6 3/8	- 1/4	-3.7
A	CALCOMP	4- 7	5 3/4	0	0.0
O	CAMBRIDGE MEMORIES	3- 5	4 5/8	- 3/8	-7.5
N	CENTRONICS DATA COMP	7- 22	19 5/8	- 3/8	-1.8
O	CODEX CORP	15- 38	32 3/4	-4 1/2	-12.0
O	COGNITRONICS	1- 1	1 5/8	0	0.0
	SUPPLIES & ACCESSORIES				
O	BALTIMORE BUS FORMS	4- 5	5 1/4	0	0.0
A	BARRY WRIGHT	5- 7	5 7/8	- 1/8	-2.0
O	CYBERNATICS INC	1- 1	3/4	0	0.0
A	DATA DOCUMENTS	29- 42	34 7/8	+ 1/8	+0.3
O	DUPLEX PRODUCTS INC	12- 25	20 3/8	- 3/4	-3.5
N	ENNIS BUS. FORMS	5- 7	6	- 1/8	-2.0
O	GRAHAM MAGNETICS	5- 9	7 1/4	-1	-12.1
O	GRAPHIC CONTROLS	8- 21	17 1/4	-2 1/2	-12.6
N	3M COMPANY	43- 68	63 1/2	-4 1/8	-6.0
O	MOORE CORP LTD	39- 48	48 1/4	0	0.0
N	NASHUA CORP	15- 22	17 7/8	-1 3/8	-7.1
O	REYNOLDS & REYNOLD	11- 24	15 1/2	-1 1/2	-8.8
O	STANDARD REGISTER	11- 18	17 1/2	+ 3/4	+4.4
O	TAB PRODUCTS CO	4- 8	6 1/2	0	0.0
N	UARCO	17- 24	23	+ 5/8	+2.7
O	VANIER GRAPHICS CORP	4- 7	5 1/2	- 1/2	-8.3
A	WABASH MAGNETICS	3- 5	4 1/4	+ 1/8	+3.0
N	WALLACE BUS FORMS	15- 25	23 3/4	- 3/4	-3.0

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR



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